FEBRUARY, 1958

Commercial Fertilizer
and PLANT FOOD INDUSTRY

How to Sell More Mixed Fertilizers for the No. 1 Crop

SEE PAGE 19

Advertisement of NITROGEN DIVISION, ALLIED CHEMICAL

QUIZ

For Multiwall Bag Buyers

"How Does Your Packaging Operation Rate?"

1. Is your bag correctly sized for your product?
2. Is your bag properly constructed for your product?
3. If loss of product is caused by deterioration, would special protective sheets help to reduce such loss?
4. Is the total cost of your bag out of proportion to the selling price of your product?
5. Does your product cost warrant redesigning your bag to merchandise your product more effectively?
6. Are you using the most economical filling machine available for packaging?
7. Are your current suppliers giving you the service you desire?
8. Are your suppliers integrated and capable of maintaining dependable service at all times, under all conditions?
9. Are your suppliers' representatives qualified to help you with your packaging, sales promotion and marketing?

Perhaps we may be able to help you to arrive at the right answers in order to achieve higher production at lower costs.

KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary

630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.

Plants at St. Marys, Ga. and Gilman, Vt.

Sales Agents for The **Kraftpacker**
Open Mouth Bag Filling Machine

Gilman PAPER CO.
- St. Marys Kraft Corp.
- Gummed Tape Div.
- The Gilman Corp.
- Kraft Bag Corp.

☐ O.K. Kraft...Help me to answer your Quiz. Please have representative call. CF

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

PRODUCT MFD._____

NAME_____

DUVAL

Drilling blast holes with a multiple mounted drill in the Duval mines near Carlsbad, New Mexico. One of the many processes which bring you . . .

High Grade Muriate of Potash...

HIGH ANALYSIS • DEPENDABLE SUPPLY • UNSURPASSED SERVICE

DUVAL SULPHUR and POTASH CO.

Exclusive Distributors

ASHCRAFT-WILKINSON CO.

ATLANTA, GEORGIA

Cable address: Ashcraft

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Commercial Fertilizer
and PLANT FOOD INDUSTRY

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Commenting Freely

by BRUCE MORAN

Amid all the talk—statistically proven—about the terrific population totals we will have by the year 2,000 (which is closer by than it sounds) there is mighty little said, and apparently nothing at all done, about how we are going to handle this human flood . . . somewhere between four billion and six billion, depending on what age level is being discussed.

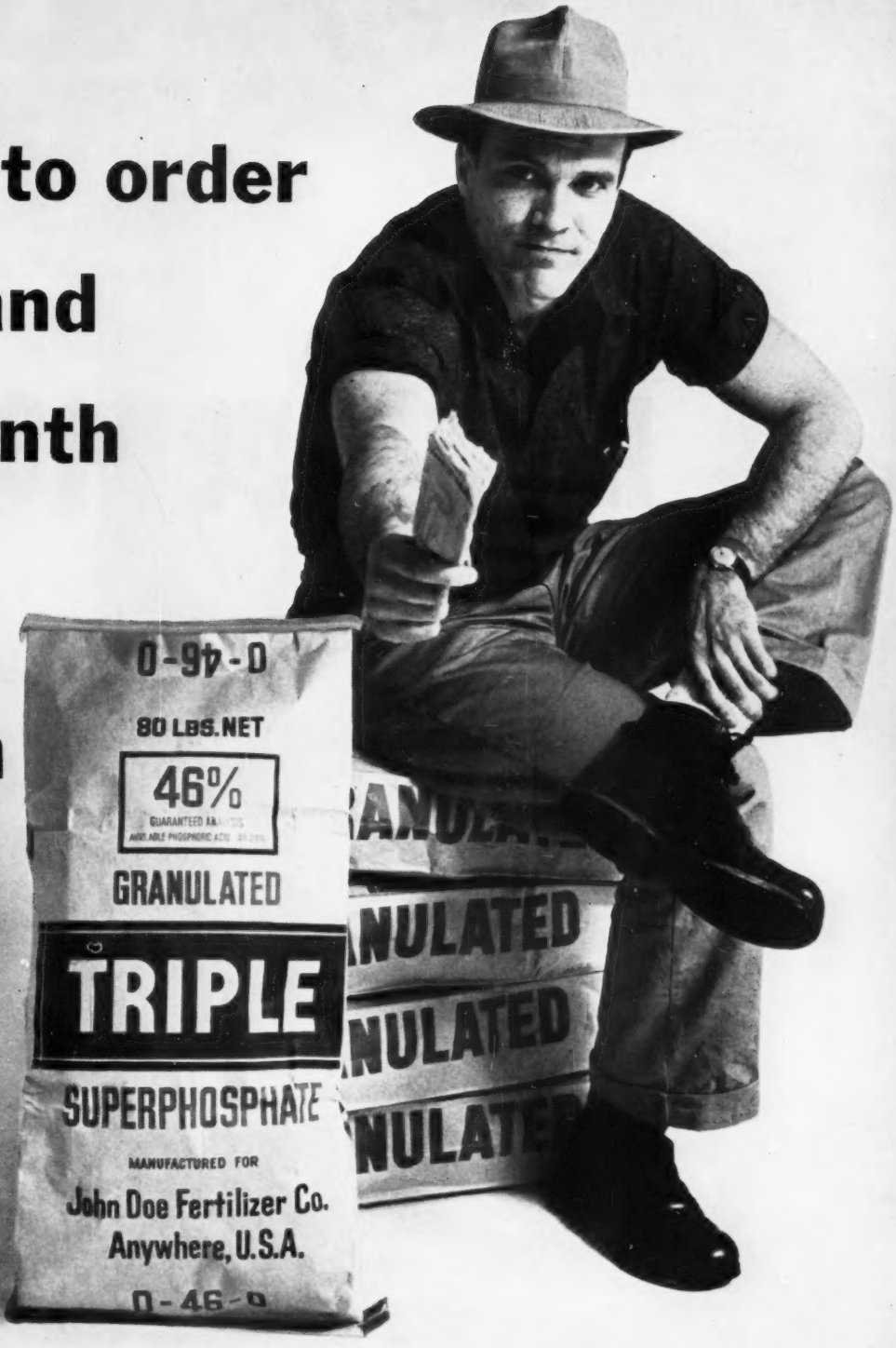
They must be fed, and our industry is giving plenty of thought to that. They must have gainful occupation, and I don't doubt that 3-day weeks will be normal by then. They must be kept from exterminating each other out of sheer boredom on the remaining four idle days of the week.

That sounds humorous—but think how you feel after a four-day Labor Day or other holiday layoff. Mighty sick of hanging around the house, unless you have a hobby that you are ardent about.

The question is raised here because maybe there's a hobby that would influence our industry, and that we could begin to build up . . . flower-growing, for one. Give it thought.

Big Dave says:

It pays to order this brand this month



Davison GTS*

*Granulated Triple Superphosphate

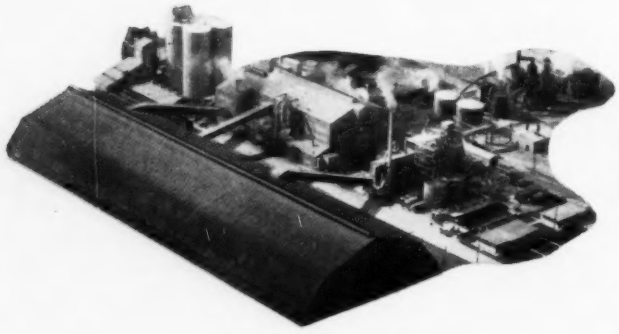
Come March, April and May, orders for Davison Granulated Triple Superphosphate reach their peak. By ordering your supply of Davison GTS this month, you'll be sure to get as much as you need of the triple superphosphate *all other granulated products are compared to.* Remember: Davison GTS guarantees you a 46% A. P. A. minimum. It is unsurpassed for direct application. It's dust free, it spreads evenly, flows freely, won't cake. And it's ideal for formulation of dry materials, particularly alkaline goods such as 0-25-25 and 0-20-20. Won't break down in handling, packaging or storage. Available in bulk or bags. Get the brand guaranteed to satisfy you on every count. Order your supply of Davison Granulated Triple Superphosphate *this month.*

DAVISON
CHEMICAL COMPANY
Division of W. R. Grace & Co.
Baltimore 3, Maryland

HOW TOUGH IS YOUR

RUN-OF-PILE — International's fine-textured Triple provides uniform particle size, even density and proper moisture level that lets you ammoniate at higher rates and temperatures.

Solve it with



INTERNATIONAL'S MAMMOTH NATURAL CURING UNIT is as big as two full-sized football fields. Natural curing over a period of weeks, the longest in the industry, insures superior physical and handling characteristics.

SIZING PROBLEM?

COARSE — International's coarse-textured Triple gives same excellent ammoniation batch after batch . . . promotes desirable agglomeration.

GRANULAR — International's new granular Triple is non-crumbling, free-flowing . . . makes granulation easier. Sponge-like structure facilitates ammoniation.

International's TRIPLE SUPER in the form you want!

EVERY TON IS NATURAL CURED

Whether your plant operation demands a fine, coarse or granular texture, you'll find International's Triple Super offers the superior physical and handling characteristics you need. But International offers much more than just the correct texture. Every ton brings you a guaranteed minimum of 46% APA — the consistent high analysis that aids in formulation and reduces the unit-delivered cost. It's the one triple that insures higher quality through extra long chemical reaction time and unmatched heat control, plus natural curing. Write or wire for full information on International's fine, coarse or new granular Triple Super.

EXTRAS put bonus value in every ton of International Triple Super

- **EXTRA grade to start with.**
- **EXTRAS in processing and natural curing.**
- **EXTRAS in quality safeguards.**

INTERNATIONAL MINERALS International MINERALS CHEMICALS **& CHEMICAL CORPORATION**

PHOSPHATE CHEMICALS DIVISION . . . . . 20 N. WACKER DRIVE, CHICAGO 6, ILL.

JUST AROUND THE CORNER *by Vernon Mount*

Federal Reserve, having demonstrated that its brakes work, has loosened them again. Of course, in the process of some of those running along behind, and not seeing the stop signal, have bumped heads. But this is not serious, and the swelling will go down shortly.

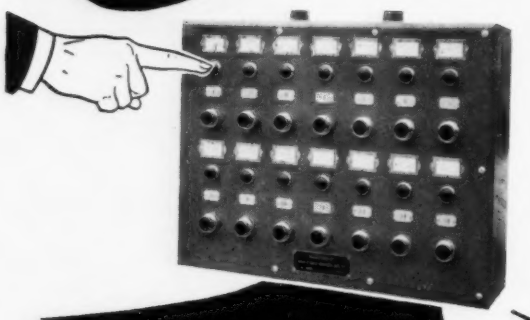
Decline stopped, pretty much, when things were loosened up. Lower re-discount rates, lower stock-market margins . . . such things put steam back in the boiler. So expect things to coast along for a bit until the steam develops a real head. Then expect things to move up slowly. And by early Fall, you will feel the old engine getting up speed again.

BIG BOOM is ahead . . . but don't expect it right away. May take a year or two, but it's in the cards and there's no doubt about that! Meanwhile, gradual approach to big boom.

Yours faithfully,

Vernon Mount

NOW **PUSH BUTTON CONTROL**



FOR DISTRIBUTION OF

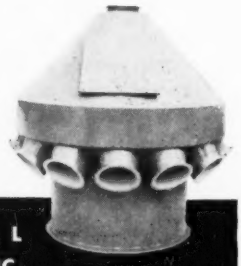
FERTILIZER

Do you ever wonder if your distributor is set on the right bin? The new FOOL-PROOF Hayes & Stolz Electric Distributor removes all doubt by signalling accurately your loading position at all times. Position can be changed only by a numbered push-button on the control panel, assuring positive selection. The new H & S Electric Distributor can be fitted with 5 to 20 openings. The diameter of these openings can be specified in 6″, 7″, 8″ 10″ and 12″ sizes. Adaptable to mounting on elevator legs, collectors, sifters, mixers, screw conveyors and belt conveyors.

HS Electric Distributor

CAN BE CUSTOM-BUILT IN ALL SIZES TO FIT YOUR PLANT NEEDS

Extra monitor panels are available to allow for check on settings from anywhere in your plant.



Engineered with care and fully backed by HAYES & STOLZ WARRANTY

Hayes & Stolz INDUSTRIAL MANUFACTURING CO., INC.

3521 Hemphill St., P. O. Box 11217 So. Side Sta., Fort Worth, Texas

32 plants . . . for prompt delivery of AA quality products

32 plants of the A.A.C. Co., located in the United States, Cuba and Canada, with main office in New York, assure you dependable, fast deliveries of AA quality products for farm and industry. You can schedule your production with confidence . . . the right quantity and grade will be at your plant when you need it.

for uniform quality, prompt delivery and technical service . . . order from

The **American Agricultural Chemical** Company

producers of:

Florida Pebble Phosphate Rock • Superphosphate
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All grades of Complete Fertilizers • Gelatin
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Sulphuric Acid • Phosphoric Acid and Phosphates
Phosphorus and Compounds of Phosphorus

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY — AA QUALITY

GENERAL OFFICE: 50 Church Street, New York 7, N. Y.

Announcing St. Regis' New

SUPER STEPPED-END

...3 big steps ahead of other stepped-end bags!

1. 3 TIMES MORE PROTECTION AGAINST SIFTING!

With exclusive new Staggered Flap construction, end flaps of the bag overlap not just once, but three different times to seal bag ends completely! Result: St. Regis Super Stepped-End Bags give you 3 different guards against siftage . . . 3 times more effective protection against product loss . . . *cleaner* bags!

2. FASTER, EASIER FILLING . . . CLEANER BAGS!

Note the new Full Insert on St. Regis Super Stepped-End Bags. This feature, tested over and over again in St. Regis laboratories and in the field, effectively reduces blow-back and siftage at the valve. And, improved pasting makes it easier to place the bag on the filling tube . . . helps step up your production!

3. ALL-PLY PROTECTION IN ALL CORNERS!

No inner ply cut-out corners to weaken the bag! With new Staggered Flaps, St. Regis is first to give you extra protection against siftage plus maximum strength in all four corners. Most important of all, St. Regis Super Stepped-End Bags give you the advantage of complete product protection. Since corners are not cut out, only the sheet designed for the job touches the product!

Stepped-End Bags were invented and developed by St. Regis. To date, more than 200 million have been bought by industries looking for better packaging. For a full demonstration of this important new development—the Super Stepped-End Bag—call your St. Regis representative today!

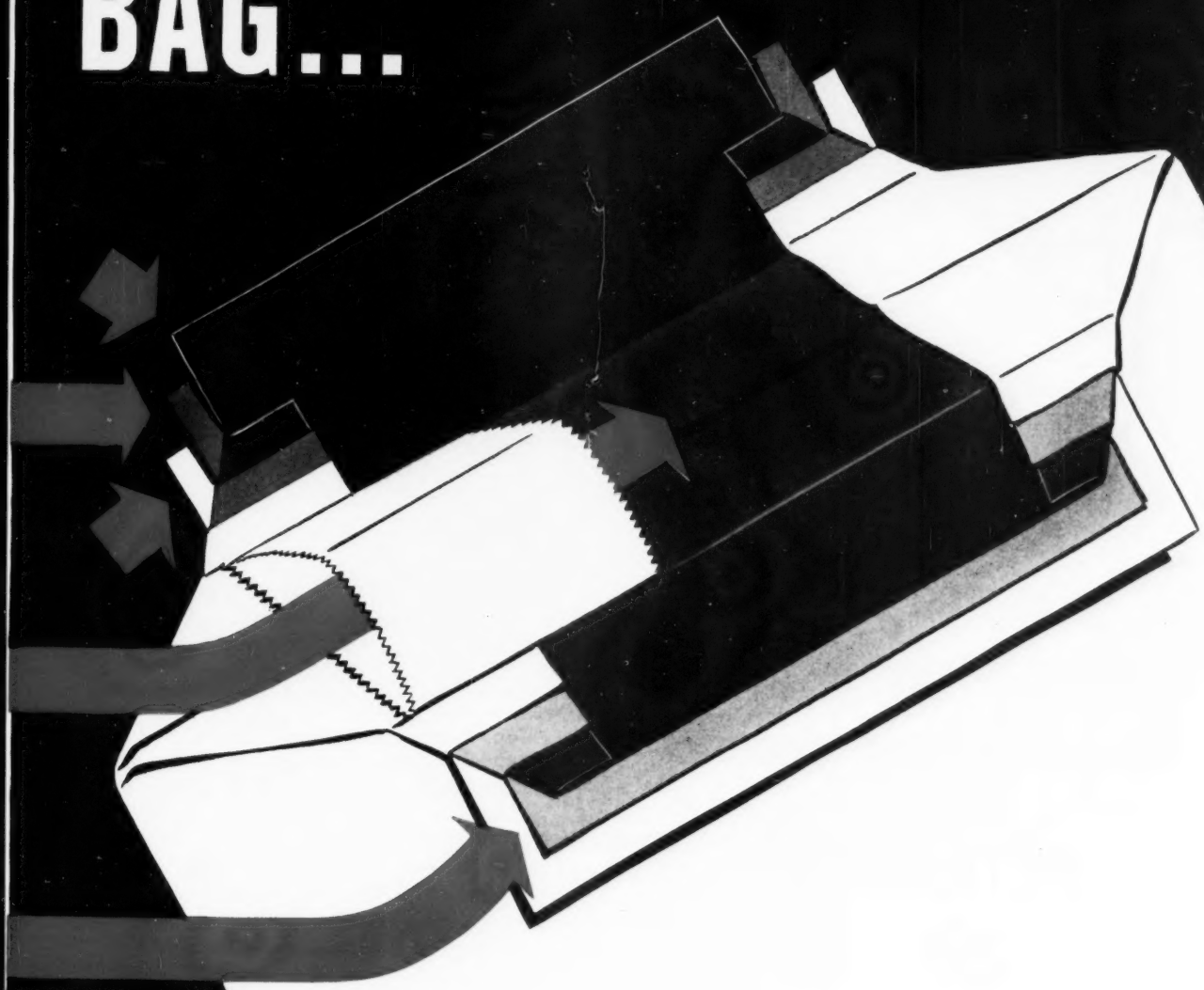
MULTIWALL PACKAGING DIVISION

St. Regis PAPER COMPANY

150 EAST 42ND STREET, NEW YORK 17, N.Y.

PULP PAPER PACKAGING PLASTICS

BAG...



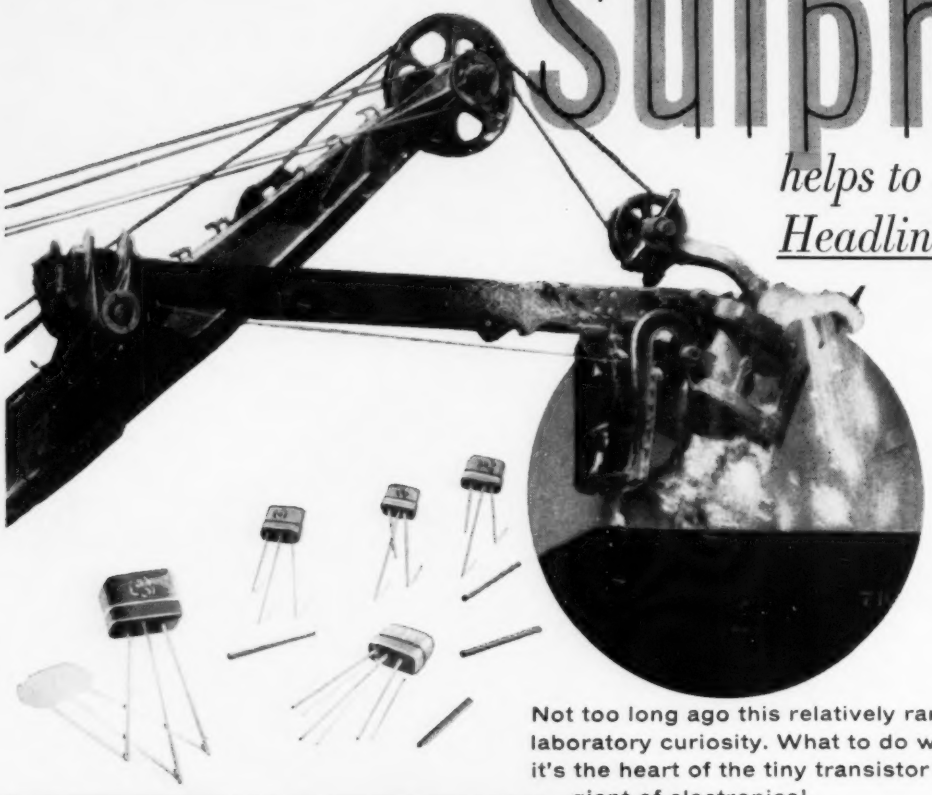
cleaner...!

stronger...!

easier to fill...!

Sulphur

helps to create
Headline Products

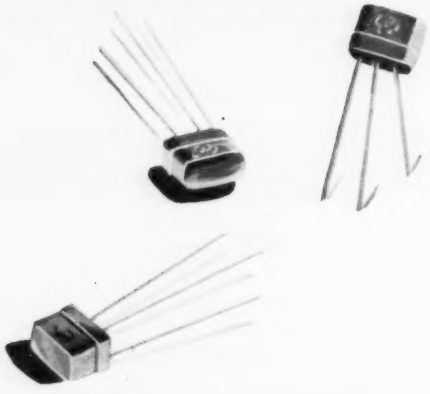


GERMANIUM

Not too long ago this relatively rare metal was a laboratory curiosity. What to do with it? Today, it's the heart of the tiny transistor—the latest giant of electronics!

What's the connection between Sulphur and Germanium?

There are two, in fact. One is man-made, involving the routine leaching of Germanium ores with Sulphuric Acid prior to tetrachloride distillation. The other takes advantage of a peculiar property of the natural mineral, Germanium Sulphide. This mineral can be volatilized and then sublimed, providing an effective method of separating the Germanium from gangue material. The process is called "Concentration of Germanium by Sulphide Sublimation".



Again Sulphur, through its major derivative, Sulphuric Acid, and a natural sulphide play an important role in our ever-expanding economy. It is difficult to find many items in the broad chemical-metallurgical field that do not somewhere along the production line make use of Sulphur or a derivative.

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N.Y.
811 Rusk Avenue, Houston 2, Texas

Sulphur Producing Units
- Newgulf, Texas
- Moss Bluff, Texas
- Spindletop, Texas
- Worland, Wyoming

U.S.I.'s new Phosphatic Fertilizer Solution plant is centrally located — at Tuscola, Illinois — for prompt service to all the Midwest.

fertilizer makers in this area are cutting costs with PHOSPHATIC FERTILIZER SOLUTION

Planning now for the season ahead? Consider these important facts:

When you formulate with U.S.I. Phosphatic Fertilizer Solution (wet process phosphoric acid) raw material costs usually are lower — as more and more fertilizer makers are discovering. PFS eliminates or reduces both triple superphosphate and nonsaleable sulfuric acid. PFS reduces nitrogen losses during mixing. It enables you to increase the amount of economical anhydrous ammonia and cheap normal superphosphate used.

Granulation is more efficient. You get high through-put capacity and low recycle loads, because Phosphatic Fertilizer Solution cuts down fines. PFS largely eliminates fumes, outside your plant as well as inside. And it entirely eliminates fire and explosion hazards frequently present with sulfuric.

U.S.I. production of Phosphatic Fertilizer Solution — 30,000 tons per year of P_2O_5 — is and will continue to be available for non-captive use.

In addition, U.S.I. can supply you with all the following, on *short notice*... Anhydrous and Aqua Ammonia . . . Ammonium Nitrate . . . Nitrogen Solutions . . . Sulfuric Acid . . . and Nitric Acid.

CALL IN YOUR U.S.I. MAN NOW

May we suggest that you get in touch with your U.S.I. Technical Service Engineer. Let him work out with you optimum formulations using Phosphatic Fertilizer Solution. He knows materials, equipment, all the factors that make up formula cost. He works with you during trial runs until production is going smoothly.

If your costs can be lowered by using Phosphatic Fertilizer Solution (and they probably can be) he will help you find out. Quickly. Reliably.

If you would like the U.S.I. man to work with you, write to us. Or — better still — telephone collect.

U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers and Chemical Corporation

99 Park Avenue, New York 16, N. Y.

Branches in principal cities

NEW granular triple

non-crumbling, free flowing ...and it ammoniates

Something new and different?

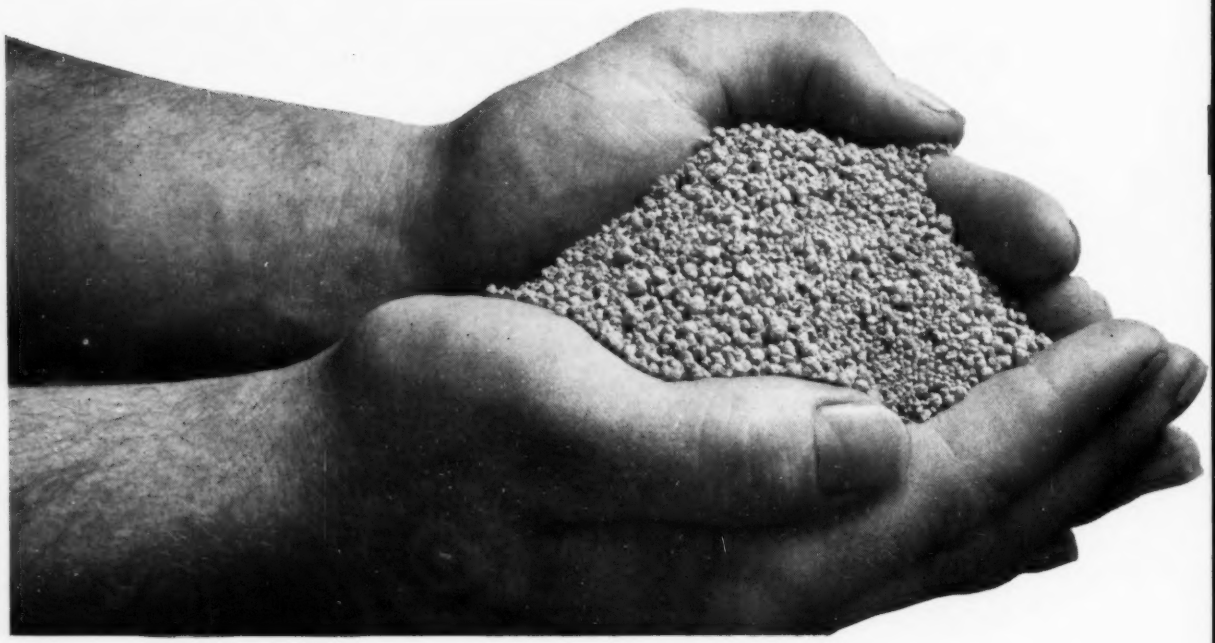
Yes . . . so new, in fact, there's no other granular triple super like it in the industry. The reason:

Every granule of International's new Triple Super has a unique sponge-like structure to *facilitate ammoniation* and contribute to desirable granular texture in your mixed goods. Yet each granule has plenty of strength to stand up without crumbling during handling.

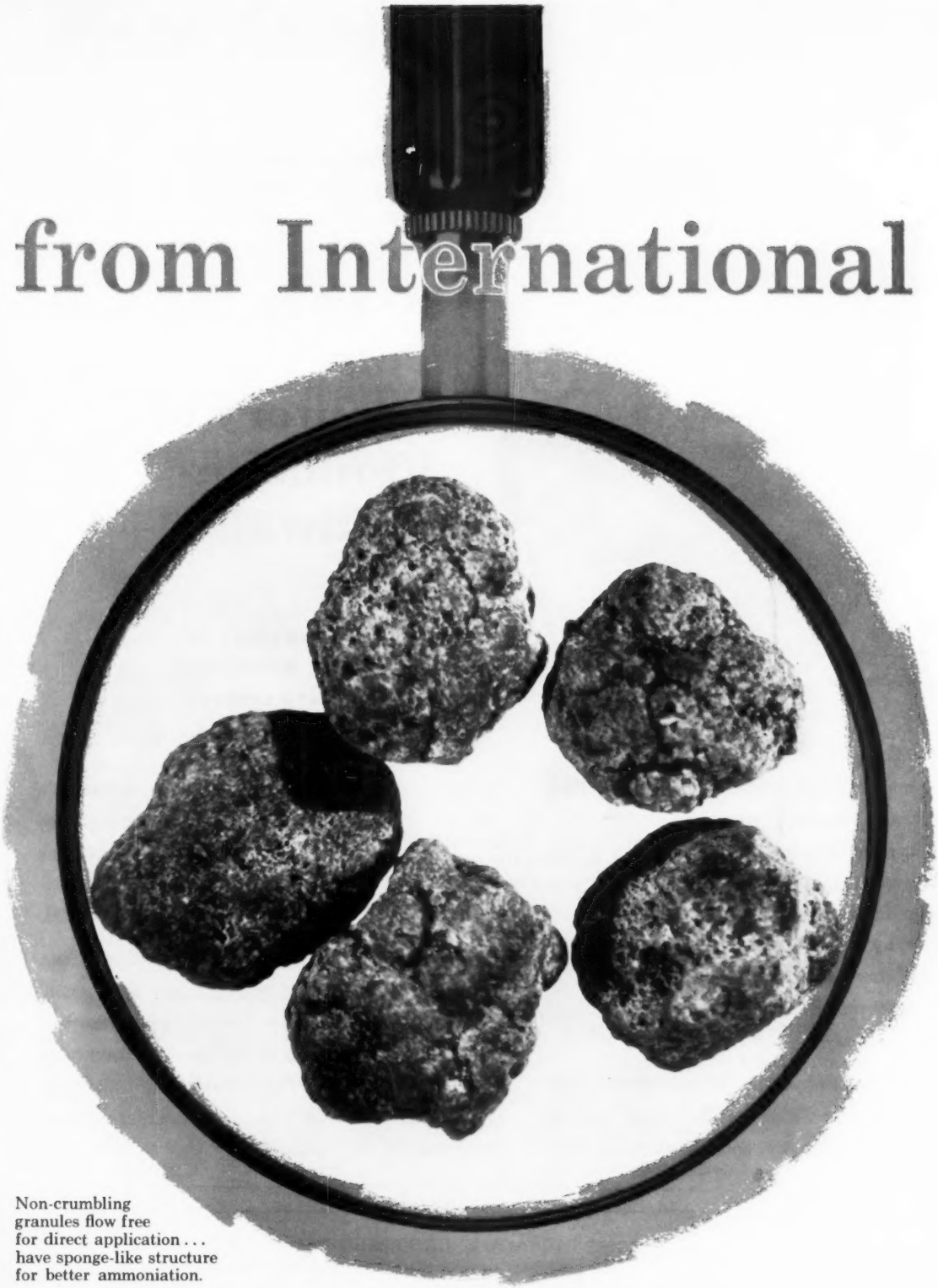
Important, too . . . you can't beat this new granulated triple for *direct application.* It's packed with customer-pleasing qualities. International granules are non-crumbling . . . free flowing. They won't bridge over in a fertilizer drill . . . won't crumble during handling or spreading.

Have your International man show you how this new granular triple can help you widen your profit opportunities in manufacturing mixed goods . . . or when selling for direct application in bulk . . . or bagged under your own label as 0-46-0.

Write or wire for full information.



from International



Non-crumbling
granules flow free
for direct application . . .
have sponge-like structure
for better ammoniation.

INTERNATIONAL MINERALS MINERALS International CHEMICALS **& CHEMICAL CORPORATION**

PHOSPHATE CHEMICALS DIVISION . . . . . 20 N. WACKER DRIVE, CHICAGO 6, ILL.

THE MAN WITH THE MULTIWALL PLAN

UNION PACKAGING ENGINEER ROBERT BOLLING

cuts 60 sizes from inventory of 20-million-Multiwall user

Impressive savings in cost, space, handling and inventory control

A leading manufacturer of plant food has simplified his Multiwall inventory problem, reduced his packaging costs, released valuable storage space, and saved an impressive number of man hours by revising the Specifications Manual which guided his company's purchase of 20 million bags a year.

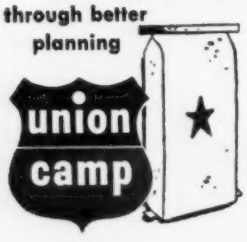
Union Multiwall Recommendations are based on this 5-point Packaging Efficiency Plan

- DESIGN
- EQUIPMENT
- CONSTRUCTION
- SPECIFICATION CONTROL
- PLANT SURVEY

The opportunities for more efficient control were first pointed out by Packaging Specialist Robert Bolling of Union. With the consent of the manufacturer, Bolling then surveyed the company's complete bagging operation. The new Specifications Manual was one of the results. Savings are expected to run well over $100,000.

Union Multiwall Specialists have helped many companies effect substantial economies and gains in Multiwall performance. Ask about Union's 5-Point Packaging Efficiency Plan, and how you can take advantage of it without either cost or obligation.

Better Multiwall performance through better planning



UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

UNION MULTIWALL BAGS

UNION BAG-CAMP PAPER CORPORATION

233 BROADWAY, NEW YORK 7, N. Y.

New from Du Pont...

UAL-S

A Uramon® Ammonia Liquor containing ammonium sulfate for improved manufacturing and agronomic properties

Now, Du Pont offers a "Uramon" Ammonia Liquor containing ammonium sulfate. This new urea-ammonia solution, called UAL-S, combines two efficient forms of nitrogen with ammonium sulfate to provide added sulfur . . . an essential plant nutrient with recognized agronomic value.

All fertilizers benefit from nitrogen derived from UAL-S. Regular mixtures cure well, are free-flowing and resist caking. In granular mixtures, UAL-S aids in producing good yields of hard, round, firm granules that store and distribute well.

UAL-S is safe—handles at moderate pressure and there's no danger of flash fires. It's non-corrosive to fertilizer manufacturing equipment, including mild steel and aluminum. UAL-S has a low freezing point, too . . . can be stored year round in most areas.

Du Pont specialists can give you at-the-plant advice on proper use of UAL-S in your fertilizer mixtures. They stand ready to assist you in profitably formulating mixtures containing UAL-S. For further information on UAL-S, and to request the services of one of Du Pont's specialists, write the nearest office.

E. I. DU PONT DE NEMOURS & CO. (INC.)
POLYCHEMICALS DEPARTMENT
WILMINGTON 98, DELAWARE

District Offices:

1616 Walnut Street
Philadelphia 3, Pa.

7250 N. Cicero Avenue
Chicago 30, Illinois

Du Pont Company of Canada (1956) Limited, 85 Eglinton Avenue East, Toronto, Canada

DU PONT
REG. U.S. PAT. OFF.

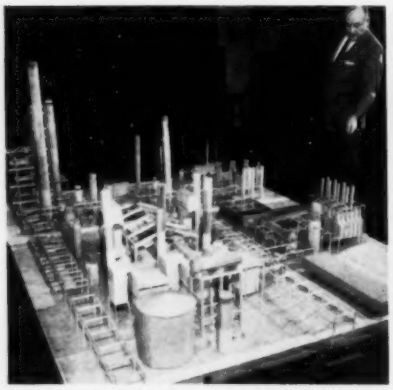
URAMON®
AMMONIA LIQUORS

25 ANNIVERSARY UAL SOLUTIONS
25 YEARS OF SERVICE TO THE FERTILIZER INDUSTRY

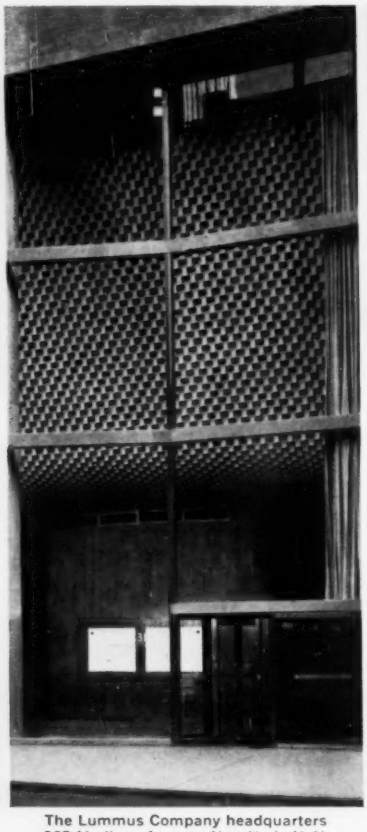
Du Pont UAL solutions in mixed fertilizers have helped American farmers grow better crops for 25 years.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

This is one of a series of advertisements on Lummus' world-wide facilities



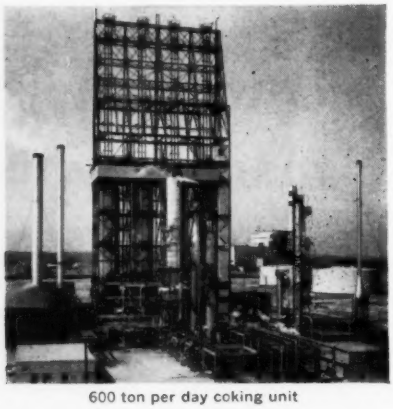
200,000,000 lb. per year ethylene plant



The Lummus Company headquarters
385 Madison Avenue, New York, N. Y.

Beryllium plant

High pressure acetylene chemicals plant



600 ton per day coking unit

Lummus New York is headquarters for design, engineering and construction

Engineers and Constructors of More Than 700 Refineries, Chemical and Petrochemical Plants of all Types and Sizes Throughout the World in the Last 50 years.

The Lummus Company headquarters are at the business crossroads of the world in New York, ready to coordinate the engineering skills of over 3,000 permanent employees located in seven branch offices and subsidiaries throughout the world.

A staff of more than 1,000 scientists, engineers and administrators contributes a wealth of skill and experience – each in his chosen field – to handle the great mass of detail involved in a modern processing plant. Few single companies in the process industries can afford to maintain the reserve of industrial experience and engineering skill that characterizes the Lummus organization.

In addition, Lummus maintains a 150,000 square foot Engineering Development Center in Newark, N. J., to bridge the practical gap between laboratory research findings and commercial plant operation. The Center has extensive pilot plant facilities in operation, and is equipped for designing and building new units.

Several recent domestic projects of The Lummus Company (pictured above) are: a 200,000,000 lb. per year ethylene plant; the world's first full scale, high-pressure acetylene chemicals plant; a beryllium metal plant; and a 600 ton per day coking unit designed for the heaviest charge ever fed to a coker.

See Lummus on your next project.

Branch offices of The Lummus Company are located at Washington, D. C.; Chicago; Houston, and Baton Rouge.

Subsidiaries are in Montreal, Caracas, London, Paris, The Hague and Bombay.

LUMMUS

ENGINEERS AND CONSTRUCTORS FOR INDUSTRY
385 MADISON AVENUE, NEW YORK 17, N.Y.

Arcadian® News

Volume 3 | For Manufacturers of Mixed Fertilizers | Number 2

How to Sell More Mixed Fertilizers for CORN

Corn is the biggest single market for fertilizer in this country. Every state grows corn. More fertilizer is used on corn than on the next four crops combined. Yet many fertilizer manufacturers are not taking full advantage of this market because they do not produce mixed fertilizers which supply the complete plant food needs of corn. Farmers are forced to use heavy applications of nitrogen, in addition to mixed fertilizers, to grow big yields.

You can capture more of this market for mixed goods by producing and selling high-analysis, high-nitrogen fertilizers for corn. It takes 160 pounds of nitrogen, 60 pounds of phosphoric acid and 120 pounds of potash to grow 100 bushels of corn. Yet some fertilizer manufacturers are still promoting a 1-4-4 ratio for corn.

It is true that the fertilizer analysis cannot be based on actual plant food removal. More phosphorus is needed because part of the phosphorus is changed in the soil to forms not immediately available. Less potash may be needed because much potash stays in the stalks which are plowed down.

Stalks also contain nitrogen, but to speed the breakdown of old stalks and roots into nitrogen-rich, potash-rich organic matter, fertilizer nitrogen is needed to feed the soil organisms that do the job.

About 20 pounds of nitrogen per ton of stalks is the accepted figure, and a 100-bushel crop produces 3 to 4 tons of stover and roots.

In any event, corn is a crop that requires plenty of nitrogen to produce profitable yields. Why not recognize this fact and sell high-analysis, high-nitrogen fertilizers for corn. More and more manufacturers are increasing their profits by selling 2-1-1 ratios, such as 16-8-8, 14-7-7, 12-6-6 and 10-5-5, as plow-down fertilizers for corn. High-nitrogen mixed fertilizer plowed down in the fall or spring, followed by the proper mixed fertilizer at planting time, can supply the total plant food needs of corn with mixed fertilizers.

Good farmers are going to use plenty of nitrogen on corn. It will pay you to sell this nitrogen in mixed fertilizers. For information on how to make high-nitrogen fertilizers, turn the page . . .

Arcadian News for Fertilizer Manufacturers . . . . . from NITROGEN DIVISION

How to Make High-Nitrogen Mixed Fertilizers for Corn

Most farmers who produce big yields of corn are big users of nitrogen. If you add together the total plant foods they use on the crop, including mixed fertilizers and straight materials, you'll often discover a 2-1-1 ratio or a similar high-nitrogen combination. So why not put this combination in your fertilizer bag and supply the needs of corn with mixed fertilizer?

The new trend in mixed fertilizers for corn is toward high-nitrogen ratios for two reasons: 1) Corn needs high-nitrogen fertilizers to produce profitable yields. 2) The new ARCADIAN® Nitrogen Solutions make it easy and practical to formulate high-analysis, high-nitrogen mixed fertilizers in almost any plant.

The trend is obvious. Where 1-4-4 and other low-nitrogen analyses once were predominant, 1-1-1 ratios have become important and some manufacturers are having outstanding success with 2-1-1 ratios, such as 16-8-8, 14-7-7, 12-6-6, and 10-5-5. Why not take advantage of this trend to build your own sales and profits?

As a result of the development of modern ammoniating solutions, high-nitrogen fertilizers are now much easier to make in regular mixing equipment. One successful method uses URANA® or NITRANA® Solutions which are high in nitrogen and low in free ammonia. These solutions, plus sulphate of ammonia, are enabling mixers to put a high-nitrogen content into good quality mixed fertilizers.

Another practical method uses URANA or NITRANA Solutions with a high content of free ammonia, with the addition of sulphuric acid in the mixing. This amounts to making your own sulphate of ammonia during the mixing process.

Either method will produce good quality, high-analysis fertilizers with real economy. The best method for you to use depends on plant equipment, cost of materials, and the actual ratios you wish to produce. Your Nitrogen Division technical service representative can be helpful to you in selecting the method best adapted to your particular needs.

Production of high-nitrogen mixed fertilizers for corn and other crops will enable you to supply a bigger share of your customers' total fertilizer needs with mixed fertilizers. You will also be in a better position to increase your sales of actual plant food, with lower freight rates and greater profits.

For technical help on the production of high-nitrogen fertilizers in your plant, contact Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N. Y. This service is available to customers, without charge.

EVERY FIELD A DEMONSTRATION PLOT!

One of the best ways to demonstrate the value of fertilizer is to persuade farmers to run their own simple fertilizer tests. Suggest to the farmer that he use no fertilizer on one strip across his field. This makes a check strip. Then tell him to double the usual fertilizer application on the next strip. Then use his normal fertilizer application on the rest of the field. Time spent in getting farmers to run these simple tests will pay off in extra sales. The photo above shows a wheat field where one strip got no fertilizer. There is a big difference in the rest of the field where fertilizer was used. But, remember this! Many farmers, even when they follow state recommendations, are not using enough fertilizer for maximum yields and profits. A strip with double the usual fertilizer application is often one of your best sales tools!

Survey Results Now Available

A report has been prepared based on the results of a new and intensive survey to determine motivations that influence farmers' fertilizer buying habits. This personal-interview survey was conducted by an independent research organization employed by Nitrogen Division, Allied Chemical. *Part 1* of the findings of this survey is now available for distribution. It contains significant new information of interest to fertilizer manufacturers. To obtain a free copy, simply request *Farm Fertilizer Survey, Part 1* from Nitrogen Division, 40 Rector Street, New York 6, N. Y. Your copy will be mailed to you promptly.

ANALYZING FERTILIZERS for PLANT FOOD CONTENT

It is vital to your business to make sure that control officials find correct analyses when they examine your fertilizers. You may formulate with the right amounts of ingredients, using good machinery and skilled operators, but if your fertilizers fail to meet minimum guarantees you are in trouble.

Nitrogen Division has conducted extensive research in the development of more efficient methods for determining the plant food content of fertilizers.

Part of this research has been devoted to the sampling of ammoniating solutions. A "squeeze bottle" method invented by a Nitrogen Division chemist proved to be outstanding in simplicity and accuracy. Presented at the 1956 meeting of the Association of Official Agricultural Chemists, this method is winning rapid acceptance.

Some problems require the united efforts of many chemists. Nitrogen Division cooperates fully in this work.

In analyzing fertilizers high in both nitrate and chloride, such as many 10-10-10's and 12-12-12's, chemists knew they were losing nitrogen during the Kjeldahl digestion because they saw brown fumes escaping. The reduced iron method was devised to avoid this loss, and given official status by the A.O.A.C., after cooperative testing in which Nitrogen Division chemists participated. In addition to providing better analysis of 1-1-1 ratios, this method is also helpful in analyzing nitrogen solutions that contain urea.

Sometimes it is necessary to determine distribution of nitrogen in different forms, as well as finding total nitrogen content. As a special case, there may be interest in the amount of biuret. Confronted with this problem, Nitrogen Division chemists studied known procedures and then developed a more accurate method. Published in 1955, this method is now generally accepted. Work is now under way to apply this procedure to complete fertilizers.

About two years ago, analytical difficulties were noted in lawn fertilizers containing a natural organic, such as activated sewage sludge, along with urea. Analyses were consistently a fraction lower than expected in water-soluble organic nitrogen. Were the analytical methods at fault or was part of the organic nitrogen converted to ammoniacal nitrogen in the manufacturing process?

To find the answer, blends of ingredients were made in the Nitrogen Division laboratory and 8-6-4 and 10-6-4 were produced on a small scale for testing. Standard analyses were made and separate direct analyses were run for urea. Samples contained practically all of the expected urea. Even when samples were kept for a month at 122°F. the urea nitrogen content had decreased only slightly.

These tests showed that an *apparent* loss of organic nitrogen, with offsetting higher values of ammoniacal nitrogen, was due to conversion of part of the urea to ammonia during the analysis and, to a slight extent, by conversion of some natural organic to ammonia. It was found that these discrepancies could be minimized by close attention to analytical detail. For best results, a milder procedure for determining ammoniacal nitrogen was recommended.

In the direct determination of urea content, the basic procedure involves the enzyme urease which splits urea into ammonia and carbon dioxide. Nitrogen Division chemists have found a simple way to apply this procedure to mixed fertilizers, avoiding the interference generally caused by phosphate.

These are only a few of the many ways that Nitrogen Division chemists are working to improve old analytical procedures and devise new ones as required. With fertilizer technology now in a state of rapid change, continuing research is vitally important in solving the problem of meeting minimum guarantees.

200 NEW TANK CARS. To expedite delivery of Nitrogen Solutions to mixed fertilizer plants, Nitrogen Division, Allied Chemical, is adding 200 new units to its large fleet of tank cars. All of these new cars, made of aluminum and especially designed for handling all types of Solutions, will be in service this month. Another way that Nitrogen Division, Allied Chemical, is constantly expanding its facilities and improving its service to customers.

HERE'S THE BIG LINE OF Arcadian® NITROGEN SOLUTIONS

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	26
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.188	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.052	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
10	44.4	24.5	56.0	10.0	9.5	11.0	1.108	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.081	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	12.7	1.052	29	1
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.925	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.972	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	—

Other ARCADIAN® Nitrogen Products: UREA 45 • A-N-L® Nitrogen Fertilizer Ammonium Nitrate • American Nitrate of Soda • Sulphate of Ammonia

NITROGEN DIVISION Allied Chemical & Dye Corporation

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Let's forget it can't be done . . .

. . . Let's just go out and do it!

Nothing happens until something is sold . . . No real progress is made until it is sold for the second time —until the customers come back for more. That is we think a fair statement of what management should be thinking about in our industry.

But we can go a lot further. Nothing is sold the first time unless the prospect is fully informed of its value to him. It must loom larger in his eyes than the money in his pocket (or the credit he rates in his community).

We can go still further. Nothing stays sold unless it was good enough to have been bought in the first place, by the man who needed it, just as soon as he was really given all the facts about it.

That is our own thesis, embroidered from contact since 1910, which this paper's editorial staff has enjoyed with the really aggressive fertilizer merchandisers. It makes a good background against which to mount our soap-box and try to say what our industry needs at this stage of the game.

There is, of course, real reason for nail-biting just now, because we have more fertilizer on the floor than the farmer is willing to buy. Things will be different mighty soon, as all the economists are doing their level best to tell us,—what with the amazing population rise now going on, and the boom seen not so far ahead. But that doesn't help this year's figures.

The sad thing is that unless some of us get up off our soft cushions and get busy with real selling, the boom up ahead will benefit only the wide-awake boys; the business will flow to them when the thaw comes.

And you can trace this rocking chair tendency back to the fact that our industry has miraculously been tripled for us by a couple of wars, during which the farmer practically got down on his knees, begging for plant food which would grow the crops the armed forces needed.

We didn't sell it.

We didn't sell high-analysis.

We didn't sell more plant food per acre.

We didn't sell 7,000,000 tons up to 22,000,000 tons.

These things just happened to us, and we needed and we built many millions of dollars worth of huge prime-material plants. We'll need them soon . . . but just now they are a little in the white elephant category.

But, as we have said, the dam will bust; the river will flood again—but whose wheel is turned depends on who gets up off his velvet cushion, and does something about selling.

Our friends in the solutions business have an edge in this worthy project. It is really only a few years ago that the voice of Dr. W. B. Andrews, was dimly heard from Mississippi, saying that plant food could be poured as well as sprinkled; that solutions could be run from tanks. The voice grew louder and louder. The idea moved north with a speed astonishing to all who know the conservatism of the farmer. It was pretty wonderful . . . but the solutions distributors were not fooled by this seeming miracle. They knew they had a selling job to do, to consolidate their positions.

And they are still selling.

Their convention was built around the very fundamentals of selling.

Their speakers reach back into the past and ask us to remember that we didn't believe in such foolishness as the horseless carriage, nor the wireless—nor, for that matter, the wired telegraph. As for scooting around under the sea for months at a time . . . that was strictly Jules Verne fiction,—because in those days the atom was the irreducible unit of matter. And nobody expected to get any closer to the moon than the eye-piece of a telescope.

People thought these things would be nice if they came along, but it was silly, really, to take them seriously.

But they came, and they were sold . . . because they were things people needed and wanted.

The farmer wants to grow better and bigger crops.

But the farmer is afraid of anything new. He is the essence of conservatism. As who wouldn't be, in his fix?

The solutions folks were told by Mr. Everett that the way to sell is to buddy up to the prospect. It is fine and important and necessary to know all about your product. A salesman cannot know too much about his product. But he can tell too much. He can get involved so deeply in technology that he confuses the prospect.

Our prospect wants to make a crop and a profit . . . that's what we need to sell him.

Our prospect gambles his whole year's income on the plant food we sell him.

Our prospect must have faith in the man who sells him.

Hence that man must really know how to buddy up.

But, as we have said here before, it is a problem to find the manpower (within the framework of our

Our entire industry could take a leaf out of the book of the solutions people, as demonstrated by their convention a couple of months back. They did something which every industry, in fact every business, should do . . . make believe nobody ever heard of the product before, and start over from the ground up. Let's see how that works, by translating into more general industry terms what our notes indicate was said at Cincinnati in November by a couple of the speakers. One was Professor John Sharp, Ohio State; the other was a professional trainer of salesmen, Ralph Everett, of Empire Sales Training Center. Remember, this is a very free, free translation, with our own interpolations, and no direct quotes.

price and profit structure) to do this contact work. As we have said, only the very small fertilizer operator can personally meet and become friends with the farmer. The rest must depend on filtering down through the ranks, until finally the job is passed along to the clerk in the fertilizer dealer's place . . . And that's a lot of filtering.

But it brings us to the basic points made by Professor Clark. And they were really basic . . . bed-rock points. He went all the way down to the kindergarten level in his talk, and spoke to those management people as though they had never heard of such a thing. Which was good.

Our whole industry, with mighty few exceptions, needs to go back to school in selling . . . and that goes for management as well, because over all we are most of us thinking as our grandfathers thought, who produced fertilizer with two shovels and a wheelbarrow. We are still letting them come and get it; hoping for the best, but not doing anything very constructive about it.

The solutions folks, starting with a new product, have started at the beginning. They welcomed a kindergarten approach. They drank up eagerly the fundamentals as they exist today. They are a new force in the industry, with fewer traditions, fewer bad habits, fewer taboos and phobias.

They just don't know it can't be done, so they go ahead and do it.

Dr. Sharp talked about the three basic functions of management: Planning, Direction, Control. How much of any of these are we really doing? How many of us fly by the seats of our pants, making an educated guess each mid-year, and setting production and prices by that? How many of us let our experienced salesmen go along as they have for a generation, handing out bullet pencils and trading on price instead of plant food values? How many of us know and keep a tight rein on what happens out in the field in terms of dealerships that are equipped really to sell on the basis of the good job modern fertilizers can do?

How much does management in our industry really know about conditions out in the field? Not from statistics, but from climbing into an automobile and driving the back roads. For that matter, how good are the statistics that come to the typical, average management desk in our industry? Do they show, really show, what kind of land-management is taking place in the territories they cover? Do they really show what portion of the farms are well-managed, stable, solvent, making the right crops for the soil and the market?

. . . according to all the laws of aerodynamics, it is impossible for a bee to fly . . .

Without these, how can fertilizer management guide the salesman? How can a manager convince a salesman to change his ways when the salesman knows more than the manager? To teach a dog tricks, they say, you must be smarter than the dog.

As we have said often, there's plenty of information available to management—about fiscal conditions on the farm; about modern methods of land-management; about such things as minor elements and their importance; about soil-testing and its relationship to the kind of plant food to mix and sell. The trouble with most of it is that it is pretty broad in nature. Even the most consecrated land-grant college agronomist cannot pinpoint the facts on the acreage of George Spelvin in Smarrs County. But the facts can be had. It is not easy, but it can be done.

Just as we have long advocated getting the agronomist's findings down to the grass roots level, so the information can be fed back up until it reaches management. The salesman can get it from the dealer. It can be sorted out from each salesman's reports (if, indeed, our salesmen make reports that are significant). And management thinking can jump off from a firm premise instead of an educated guess.

No matter how thoroughly we do this, we will not have done it thoroughly enough.

We don't advocate going patent medicine with our selling. We don't hold with the battle of the minor elements which took place about 1937 when competition built up claims that finally were pretty silly. Bread is bread and fertilizer is fertilizer. But fertilizer can be tailored to the soil. Fertilizer can be sold on what it will do, and it can contain more than just the grade ingredients. It can be "enriched" as your modern loaf of bread is enriched.

Farmers used to buy fertilizer because it looked black and smelled of very dead fish. The farmers have emerged from that kind of buying. A lot of them are mighty well educated. We have a generation today that has a considerable leavening of agricultural college alumni.

But we are, many of us, still selling on the dead fish level.

Dr. Clark emphasized the importance of finance in all fertilizer selling, and stressed the fact that finances can help take the seasonal problem out of our sales, and divert the farmer's borrowing or time buying to normal fiscal sources. It is a fact, which our readers may well have noticed, that the financial community is a lot more interested in sensible farm financing than it used to be.

Bankers associations are publishing brochures on the subject. They are making major farm improvement loans. They are doing their best, in a lot of areas, to put the farm on a business basis. A farmer who knows his stuff can, these days, get a long-range loan for building up his land. Once upon a time there had to be something the bank could re-possess. Things are different.

But what about this matter of insufficient credit when a customer is tied up—with a crop mortgage? You know cases where the Land Grant Colleges advise farmers to split their nitrogen applications to reduce leaching. The farmer has no difficulty buying his complete fertilizer by mortgaging his crop. When time comes to apply the supplemental nitrogen his supplier "is out." Being short on cash, and with his crop already mortgaged, the farmer tries to get by with inadequate plant food —result reduced yield, reduced ability to repay his loan—due to his fertilizer suppliers' short sightedness.

What is the farmer thinking about us?

What do farmers in the Midwest think about fertilizers? To a great extent what they think is decided by what a favorite dealer tells them. Brands seem to mean a lot less than most of us think—or think they should. On the other hand, the dealer is not really much of a salesman. If a farmer likes a certain brand, there is very little effort on the part of the dealer to make him switch to another.

Another shock . . . farmers in that area generally don't believe there is any difference between different brands, so long as they are in the same for mand of the same analysis.

But, and this is good—85% of them when asked what has been the most important change for improving crops or crop production . . . answered "Use of fertilizer."

But when the question came up about how this change came about, the credit was widely distributed. Oddly "Farmers" was the leading answer, with "the County Agent" next, just ahead of "Farm papers and magazines," but with "Manufacturers" a very bad 6th place runner.

"Lower prices" were the answer in this question only 1.5% of the time, neck and neck with "Soil Testing."

This is well borne out by answers to the question on soil testing . . . only 46.7% completely follow the recommendations based on a soil test. 51% think soils tests are not practical.

Another good news point . . . 76% believe farmers in this area, in the next several years, will use more fertilizer.

In 1957, 87.9% used granular fertilizer; 95% bought in the bag. 51.4% made the decision in the Spring, and another 26.6% said "before Summer" which sounds like the same thing. 67.9% bought from a local merchant; 19.2% from a co-op.

Of the one-third who shopped around, 93% did so to get lower prices. This does not contradict the 1.5% answer recorded above, which had to do with what made farmers use more fertilizer.

An odd twist, in the light of the belief that there is no difference between brands of the same analysis, is the answer to the question " . . . would you be willing to pay a slightly higher price per ton if you were satisfied with product quality?" 66.2% said Yes to this. When the reputation of the dealer was the criterion, however, only 40.5% said Yes; and when it was "reputation of manufacturer" only 43.3% said Yes.

Product form took a 61.7% lead on the question of higher price.

On a question "How sure are you that there would be no difference in two fertilizers of the same form and analysis," the answers were very evenly divided between "positive" "somewhat sure" and "not too sure." But when one of the two fertilizers was cheaper than the other, 67.9% would choose that one. Yet 84.4% felt that good fertilizers are not cheap, and are skeptical of cheap fertilizers. Only 4.2% have confidence in the local dealer in this respect.

* * *

Your editors cannot resist a little interpretation of these findings, which Nitrogen Division did resist. We have been running here a series of articles on fertilizer selling, the theme of which is that the facts about fertilizer do not get down to the grass roots. This study seems to bear us out in every particular.

The industry is not doing a good selling job. There is very little faith in manufacturers, generally. There is very little faith in dealers generally. But, worst of all, there seems to be very little clear-cut comprehension on the part of farmers—in the Midwest—concerning the meaning of analysis, as applied to their soil problems.

They are using more fertilizer, and plan to . . . and we can be thankful for that. But we have a long, long way to go until our message gets down to where it belongs . . . in the minds of the farmers, and those various people who help them make up their minds.

The old story about the farm paper salesman who was told by the farmer he didn't wish to subscribe because "I aint farming now as well as I know how" seems to be valid . . . and that story dates back at least a generation.

No wonder we have fertilizer running out of our ears!

Everybody who sells fertilizer to the Midwest should get and study the analysis of buying habits in the states of Michigan, Indiana, Illinois and Ohio recently completed for Nitrogen Division. It is available to anyone interested in fertilizer marketing. Just ask the nearest Nitrogen Division man for it, or write them at 40 Rector St., New York 6, N. Y.

A similar study on the habits of Southern farmers is to be offered.

The study is the result of questions asked 400 farmers, and it sums up neatly the buying habits and ideas about fertilizer which exist in that area.

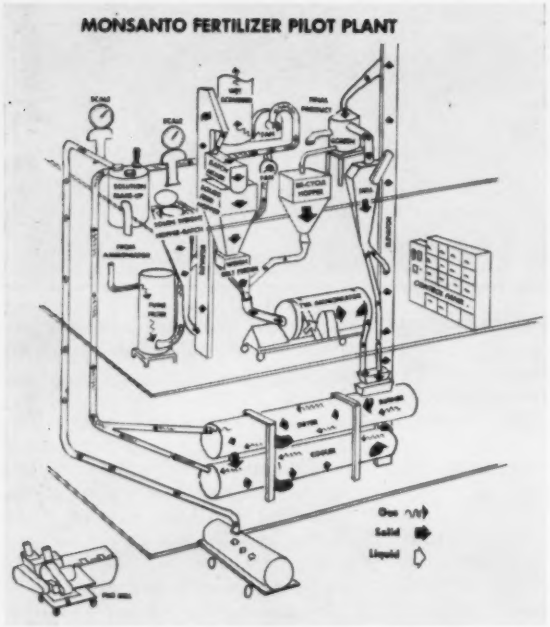
So Dr. Clark asks that, if we cannot or do not wish to extend long credits, we do at least teach our salesmen, our dealers, to find low-interest sources of capital. It makes sense.

We are in a new age, with sputniks orbiting, and men in training for a flight around the backside of the moon. The need for efficient agriculture brings on a need for efficiency in those who serve agriculture.

Let's forget it can't be done, and do it, anyhow!

UP Train-Theatre Pushes Fertilizer

The Union Pacific Railroad has a theatre on rails visiting important farming centers along its right of way for the 11th year. Aboard is a display and a staff of agronomists, who bring modern farm practices to the farmer. Its main theme is "It's Wise to Fertilize."



Schematic diagram of the Monsanto fertilizer pilot plant which is erected on three floors, with central control panel located on the second floor.

PILOT PLANT AND ELECTRONIC BRAIN HELP TO PUT A BETTER PROFIT IN FORMULATION

Each year the fertilizer industry grows more competitive and more complex, and each year the individual manufacturer is confronted by more and more problems concerning formulation and production of fertilizers. Yet, if he wants to realize the optimum profit from his plant, he must face these problems and try to solve them.

He must select the best combination of raw materials from the standpoints of economics, production capacity and operability. He must lower production and raw material costs if possible. He must revise formulations to keep up with changing raw material prices, and he must keep abreast of the continual demand for new — and generally higher—analysis grades.

All of these problems are interrelated and all involve the selection or calculation of formulations. But while such selections or calculations are being made, the manufacturer must keep in mind the physical ability of his plant to produce any new formulation he might select.

Calculation of formulations is a long and tedious job and plant down-time or changeover to accommodate new formulations involving new raw materials often is a time consuming, as well as expensive, step. Hence many fertilizer manufacturers have hesitated to commit the manpower and effort which is needed to do a good job.

Many basic materials producers, alert to their responsibility toward our industry, offer technical aid with formulation problems. One of these, Monsanto Chemical Company, has enlisted two new tools: an electronic computer and a modern, highly-versatile pilot plant. These facilities enable the company to make careful studies of the economics of any manufacturer's formulations and also to study the actual production of these formulations by simulating conditions of any given plant. The result, they feel, is a new high in their service to fertilizer manufacturing customers and to the industry as a whole.

Looking at each of these "tools" in turn, the electronic computer makes it possible to explore formulation areas in far more detail than was possible by hand formulation methods. There are ordinarily 11 raw materials for use in fertilizer manufacturing. These 11 different raw materials can be combined in hundreds of different ways. Usually it takes an experienced fertilizer man anywhere from one-half an hour to two hours to calculate a single formulation by hand. The electronic computer does the job in a few seconds!

These 11 raw materials must be combined in such a way that the resulting product meets fairly rigid specifications. Economics of formulation also must be considered. Monsanto's research has determined a set of conditions that must be met if a formulation is to yield the granular product that is desired. These conditions concern the chemistry of fertilizer manufacture, and include an optimum combination of ingredients in relation to such factors as heat, moisture, ammonia-holding capacity, nutrient value and material weight. Of course the ingredients in a fertilizer can hold only so much ammonia, for example, and additional ammonia added during the manufacturing process cannot be absorbed and is therefore largely wasted. But conditions of heat and moisture must be properly selected in order to insure granulation. Monsanto passes on to its customers only those formulations which show the clearest possible economic picture—usually the best economic possibilities for the customer's plant.

By taking advantage of the computer method of formulation, a manufacturer can benefit in a number of ways. It enables him to explore all possible combinations of raw materials and study economics of the different combinations. If a manufacturer is considering the use of a new raw material, for example, it is possible to determine whether such a move is economically feasible before he makes costly equipment changes or installations.

The manufacturer readily can obtain formulations based on changing raw material prices, formulations for new grades or formulations using raw materials of changing

composition. In addition, it enables him to correlate plant production capacity with economics.

A plant superintendent may find it advantageous in the peak season to use a formula which, although slightly more costly, would enable him to up his production. In the slack season he might want to switch to a more economical formula, even though it reduced capacity somewhat.

Many manufacturers are not sure they are operating in the most economical manner because they cannot undertake the tremendous job of hand formulating that is involved in checking costs. The computer method of checking opens the way to simultaneous consideration of all factors properly weighting each.

In order to do the job right, the computer-pilot plant team must have certain information from the manufacturer. This information includes analysis of the manufacturer's raw materials, cost of these raw materials and the grades he is interested in producing plus any additional raw materials he is interested in using. Monsanto's salesmen and technical men assist manufacturers desiring to take advantage of the formula service, and the company furnishes special forms that are filled out to facilitate handling of the required information.

The research pilot plant is a major tool in achieving objectives of the research, technical service and field sales groups. Typical projects undertaken are to: **(1)** Develop and demonstrate new techniques in mixed fertilizer manufacture. **(2)** Develop and demonstrate the use of various raw materials in mixed fertilizer manufacture. **(3)** Develop economical methods for the elimination of air pollution in fertilizer manufacture. **(4)** Refine basic data currently available to the industry through the electronic computer formulation program. **(5)** Study specific customer formulations and process problems. **(6)** Provide an educational tool for Monsanto and customer personnel by keeping abreast of new industry technology.

The research pilot plant is designed to closely approximate conditions found in any common fertilizer manufacturing process. For example, either a TVA type ammoniator or a pugmill may be used in conjunction with or without an auxiliary granulation drum in studying problems encountered in continuous processing plants. In addition, batch mixing operations can be simulated.

In design of the pilot plant unit, close attention was given to accurate metering of both solid and liquid fertilizer raw materials. Solid raw materials are batch weighed into a scale-mounted hopper. Solids discharging from this hopper are fed into a ribbon-type dry blender. Thoroughly blended dry materials are then discharged into a dry solids feed hopper; accurately weighed and blended solids are fed continuously to the ammoniation equipment with a gravimetric-type weigh-belt feeder calibrated for plus or minus one per cent accuracy.

Fines being recycled to the system are accumulated in a similar surge hopper and are fed to the ammoniation equipment along with the raw materials by an adjustable vibrating feeder. The particular nitrogen solutions being studied are made up in a scale-mounted stainless steel pressure vessel, equipped with duplex-type propeller agitation and a jacket for cooling or heating the recirculation system. A canned-type packless pump is used to recirculate the liquor.

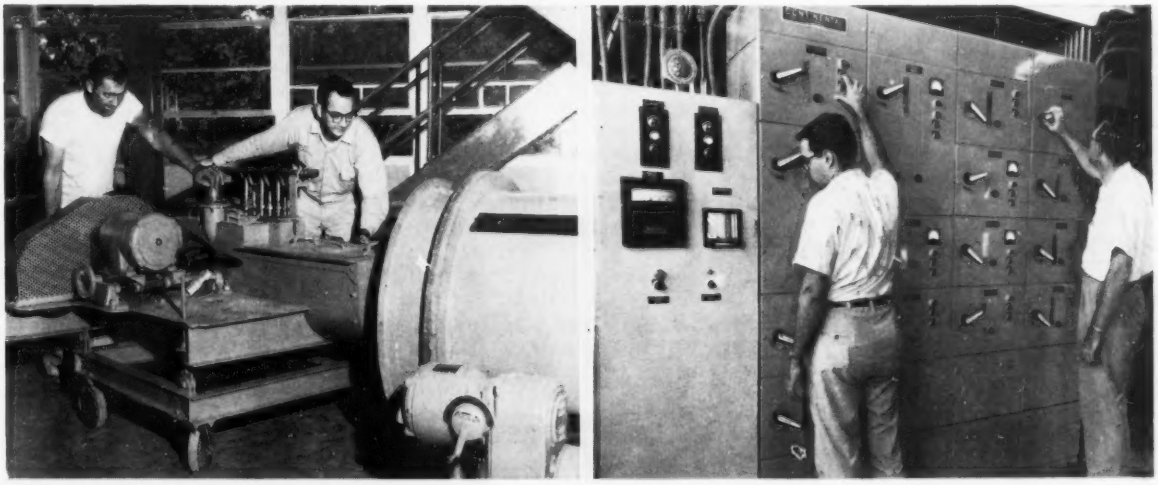
Anhydrous ammonia for batch make-up is delivered to the pilot plant area in a 1,000-gallon trailer-mounted tank. Ammonium nitrate and/or urea to be used in solution make-up are handled in 80 or 100 pound bags. Solution from the recirculation system is metered to the ammoniator with a variable area flow meter. This system is completely automatic—flow rate is recorded and controlled to within plus or minus one per cent of a preset value.

Thus major constituents of the fertilizer manufacturing processes — solids and liquids — are accurately proportioned into the system. Minor liquid constituents in formulations —sulfuric acid, phosphoric acid, nitric acid and water—are manually controlled, using variable area type meters to adjust flow rate.

The TVA-type ammoniator is equipped with variable speed drive and adjustable external apparatus for varying drum slope. The sparger system can be reoriented within the drum while the unit is in operation. Movable and interchangeable internal dams are provided to stimulate long and short ammoniators and to adjust bed depth. With these features it is quite easy to control such factors as bed depth, speed of rotation, orientation of spargers, and retention time within the unit to closely approximate conditions found at any manufacturer's plant.

Material leaving the TVA ammoniator can be routed into an auxiliary granulation drum in which the ef-

To obtain versatility in the ammoniation system, the TVA ammoniator may be replaced by a pug mill; batch ammoniation also can be assimilated. Left—Versatility in ammoniation system—Research personnel are replacing TVA ammoniator with a pug mill—batch mixer combination. The batch mixer can be used alone or in combination with the TVA ammoniator or the pug mill as an auxiliary granulator unit. Right—Central control panel.



fect of additional rolling and tumbling can be studied. This unit is equipped with small interchangeable tumbling flights and, like the TVA-type ammoniator, variable speed drive. The slope is externally adjustable. When necessary, the TVA ammoniator may be lowered onto built-in casters, rolled out of the area, and a pug mill substituted. Again much versatility is built into the pug mill equipment. Speed of rotation, blade pitch, centerline slope and solids and/or liquid feed points in the single-shaft type mill are variable.

From the ammoniating section or the granulation drum the material is dropped into a co-current dryer. Flights in the first half of the dryer are removable, again to stimulate conditions found in certain types of granulation plants where the ammoniation mass drops from a short ammoniator directly into the dryer without adequate rolling to granulate. In this case, flights are sometimes eliminated from the first section of the dryer to obtain granulation in this section. The dryer is followed by a counter-current rotary cooler of the same size. The dried, cooled product is elevated to a circular-type classification screen where the product is separated into oversize, product and fines.

Oversize is fed to a chain-type rotary breaker which discharges either to the elevator for rescreening or to the dryer intake, depending upon the amount of moisture in the material. Fines from the screen are delivered directly to the recycle surge hopper.

Two methods were employed in pilot plant design to eliminate fumes and dust from the operation. The main dryer cooler fan also is equipped with a spray nozzle for introducing water into the fan suction. This system serves as a moderately-efficient rotary collector for dust issuing from the dryer-cooler combination. The fan discharge is diverted to a two-stage spray-type collection tower equipped with interstage entrainment separators. Since the generation of ammonium chloride fume was known to occur in the manufacture of many high assay 1-1-1 ratio materials, extra precautions were taken to remove this submicronic fume from the ammoniator vent gases. To remove the ammonium chloride fume, which is almost impossible to collect using conventional wet scrubbing techniques, a Monsanto-designed glass-fiber filter was installed. This device is designed to remove submicronic fume at an efficiency approaching 99 per cent. Its design is based on operating experience gained at their own plants. Once filtered, the gases are then fed to the main wet collection scrubbing system.

With these variable pilot plant facilities, Monsanto feels it can simulate the production conditions in the majority of, if not all, fertilizer plants. Generally, the problems involving the pilot plant fall in one of three classes: problems of a long range nature, which apply to the entire industry; problems which deal with a particular segment of the industry or a particular geographical area; and the problems of the individual manufacturer.

Concerning the long range problems, research work is being undertaken in such areas as new raw materials for possible use by the industry, investigation of the best operating conditions for equipment types, and studies of various equipment characteristics. Any new developments in this phase of research will be made available to the industry when ready.

Geographical problems might involve research in a number of directions: studies might concern solutions that would be particularly suitable in certain areas, for example, or the tackling of any production problems that might exist within limited geographical boundaries.

Problems concerning the individual manufacturer are more concrete, can be approached directly and hence are of shorter duration. For instance, if a manufacturer is producing a grade with which he is having a good deal of trouble, Monsanto's sales or technical man can help him collect proper information about his facilities (using a standard form) so that his conditions can be simulated in the pilot plant. A "run" is set up using equipment comparable to the full-scale plant, with the same combination of raw materials used by the manufacturer, and the pilot plant is quickly tackling the problems.

With the almost unlimited mathematical ability of the computer, plus the extreme variability and controllability of the modern pilot plant, Monsanto feels it can help in solving almost any problem that might arise in a manufacturer's plant.

FARMER ATTITUDE TOPS MIDWEST SUBJECTS FEB. 13-14

Summary results of the study on "Farmers' Attitudes Toward the Use of Fertilizer" will get top billing at the Annual Conference of Midwestern Agronomists and Fertilizer Industry Representatives in Chicago, February 13-14.

Zenas H. Beers, National Plant Food Institute's Midwest Regional Director, and Dr. M. S. Williams, Chief Agricultural Economist for the Institute, who will make the presentation, will concentrate on results as they relate to the Midwest. National Analysts, Inc., of Philadelphia, conducted the recently-completed study for the Institute.

Some 700 people are expected to attend the conference. This popular meeting formerly was sponsored by the Middle West Soil Improvement Committee.

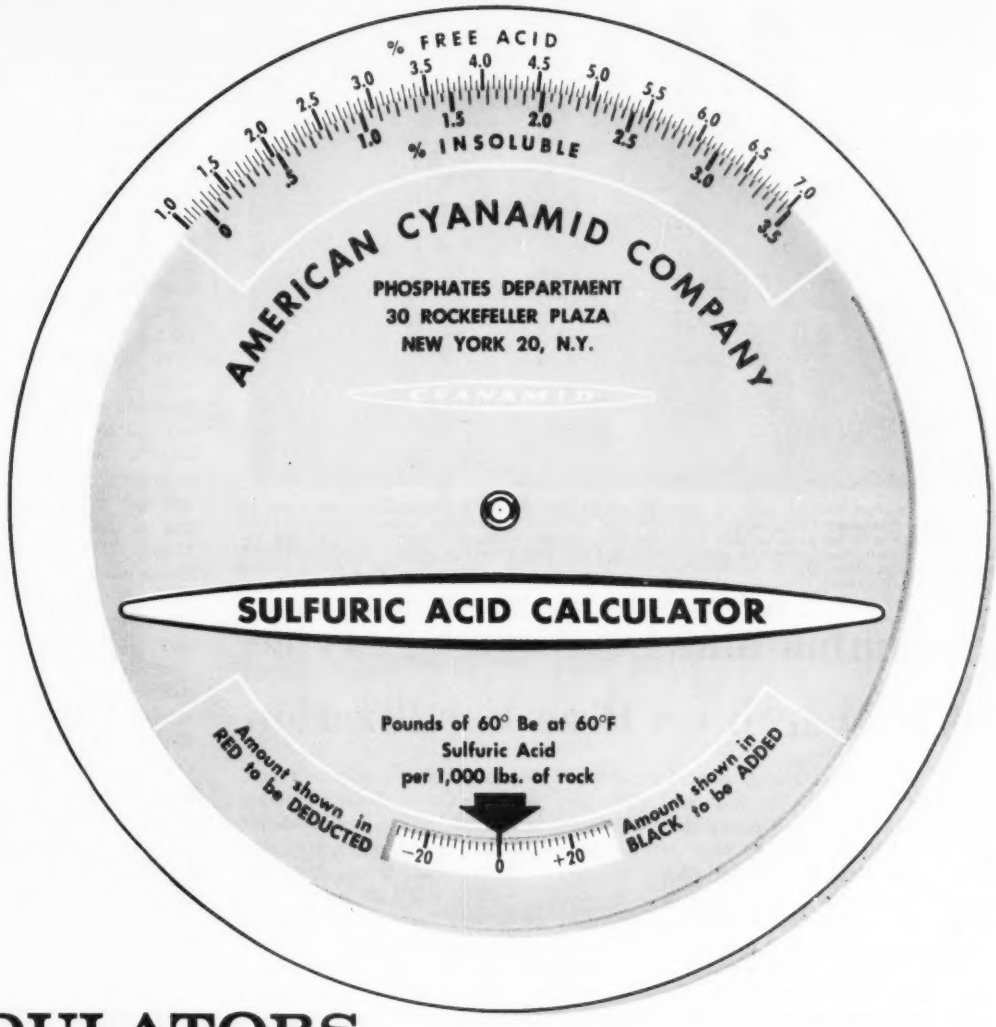
The National Plant Food Institute, through its Midwest Regional office, is sponsoring the meeting this year and intends to do likewise in the future. Dr. A. J. Ohlrogge, Purdue University, is Chairman of the conference.

Other leading subjects for the session include: 1957 experience with improved implements for proper fertilizer placement; insect control; fertilizer research reports; and effectiveness of dealers' selling methods.

Drs. J. M. Bohlen and G. M. Beal, Iowa State College, will compare the differences in the effectiveness of selling fertilizer as shown by two groups of dealers. Their presentation will show dealers' attitudes toward farmers and farmers' attitudes toward dealers, and will complement the presentation by Beers and Williams.

Prior to the conference, agricultural extension agronomists will meet Wednesday with G. P. Walker, Purdue University, presiding. On Tuesday, the North Central Soil Research Committee will meet with R. V. Olson, Kansas State College, presiding.

Room reservation cards have been mailed from Chicago to NPFI's member representatives. Personnel who do not receive cards can make reservations directly with the Edgewater Beach Hotel, indicating they will be attending the conference.



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Standard Forest Service Nursery pine seedlings will be used to plant the 100 acres of Escambia Chemical Corporation, near Milton, Florida. Different types and quantities of fertilizer will be used in this long range cooperative effort by the U.S.D.A. and industry. Shown discussing the project in the field are, (Left to right): R. C. Rayburn, Escambia Chemical, Dr. R. H. Brendemuehl, U.S.D.A., Dr. Frank Woods, U.S.D.A., Fred Hendricks, Escambia Chemical, and J. S. Williams, United Gas Company.

Escambia and US Forest Service in Research on Pine Fertilization

One of the first things undertaken, back in 1955, by the then newly organizated Escambia Chemical Corporation, was to take up with officials of the Southern Forest Experiment Station and Marianna, Fla. a project for a long-term, documented, tree-feeding research program. As a result, USDA, working through the Forest Service and with large-scale industrial participation, promises a study which may well alter drastically current forest management practices.

Basic to this study is a statement of economic forecasts governing industrial wood usage in the nation. According to Basic Timber Resources statistics for the southern United States, 178,000,000 acres are now devoted to production of wood for all commercial purposes in this nine state southern area. Representing nearly 92% private ownership by individuals and corporations, this acreage is currently producing nearly 45% of all the nation's wood and pulp supplies, with annual area production estimated at more than five billion cubic feet. Government estimates project needs for wood production to national figures of 18-20 billion cubic feet by the year 2000; under these circumstances, southern area production must be increased by nearly 100% in less than 50 years.

Fertilization, long proven in production of other crops, would seem the obvious answer to accelerated tree growth. Other factors making for accelerated growth are of course recognized, such as the genetic properties of superior trees, but this study confines itself to fertilization only as it may bear on the 'run of the mill' seedling, planted in average soil. To date only fragmentary studies of this sort have been attempted. These, unfortunately, have been largely without adequate controls, and while they have produced some statistical data, no one has yet devised a positive formula for fertilization which would justify the materials involved, methods of application, number of applications, and—most important of all—positive cost advantages in yield and rate of growth.

More than a year of planning preceded the initial land preparation for the operation, officially known as Field Fertilization of Pine. During that time, consultation was held with Dr. Robert Zahner, of the Crossett Research Center, Arkansas, who is currently conducting fertilization studies, to get his counsel in establishing the Florida Project.

The Marianna Research Center, Southern Forest Experiment Station agreed to plan and carry out the technical phases of the Florida Fertilization studies. John T. Cassady, Forester in Charge at Marianna, placed Dr. Frank Woods in charge of the studies, specifically to supervise field installations and periodic measurements of tree growth, to prepare research reports, and to maintain liaison with Escambia Chemical officials.

Industry representatives included H. W. Boynton, Assistant Director of Research for Escambia Chemical, J. S. McWilliams, Forester, United Gas Corporation, and R. C. Rayburn. Rayburn will act as local field supervisor for Field Fertilization of Pine.

To establish the control site, 100 acres of the Escambia Corporation's property near Milton, Florida was designated as an experimental tract. During the summer of 1956, existing pulpwood on the acreage was sold, cut and removed. Controlled burning of the ground cover was completed in November of that year. Remaining hardwoods of no commercial value were girdled, and remaining cover was double chopped with equipment furnished by Marden Manufacturing Company of Auburndale, Florida, and Ray-Brooks Machinery Company of Montgomery, Alabama.

Throughout the project, every effort was made to conform to practices which are standard in ordinary forest mangement circles. A soil analysis by the Department of Agriculture revealed that the soil to be used is the deep phase "Eustis Series" common to much of Florida. A chemical soil analysis will also be made.

In January, 1957, all 100 acres were planted with slash pine seedlings drawn from the standard state nursery stock, with no effort at unusual selectivity. Seedlings were planted six feet apart in rows spaced nine feet apart. Approximately 90% survival was achieved.

Rayburn, previewing the methods of fertilization to be used, stated that the entire control area will be divided into half acre plots, with 50' isolation strips as dividers. Each of the tests performed will be repeated upon three separate plots spread throughout the acreage, to provide 'controls upon controls.' The full fertilization effort calls for five basic test groups, with variations involving different types and application rates of fertilizers, and time schedules which will permit broad judgment of results. In the experiments, two basic types of fertilizers will be employed, one composed primarily of nitrogen, the other a complete fertilizer, containing nitrogen plus phosphates and

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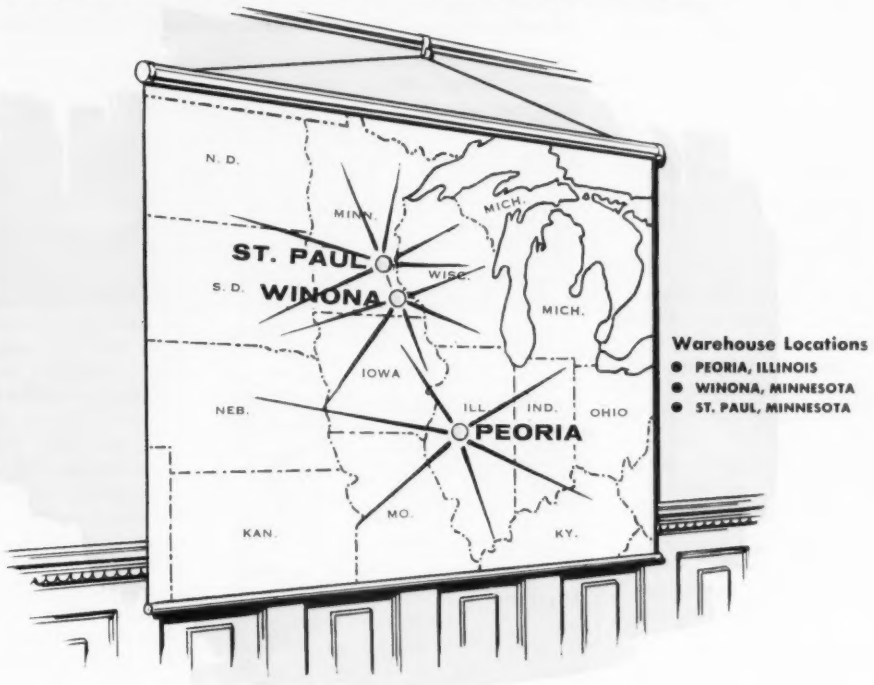

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potassium. The analysis and ratio of each fertilizer may be controlled in factory formulation, and since the application rate to cost relationship is of primary importance in this research, several different formulations will be tested, as will the frequency of application.

In Group One, tests will be made with a straight nitrogen fertilizer in three application rate levels—low, medium, and high. The application will be made just once, three years after planting.

Group Two will test a complete fertilizer in three application rates—also with a single application three years after planting.

In Group Three, a nitrogen fertilizer will be applied in medium size doses three, six, and nine years after planting.

In Group Four, a complete fertilizer will be applied in medium doses three, six and nine years after planting.

Group Five will involve tests which include the minor elements.

All fertilization will be by ground level application. Complete costs will be kept for each of the control plots, and starting with age five, all trees in the net plots will be checked for d.b.h., height, and evidence of cronartium fusiform. The data will be used to determine stems per acre, average height, basal area, and tree condition.

Preparing for this project, officials of Escambia Chemical Corporation and the United States Forest Service recognize the long-term requirements of the effort, and that conclusive findings may be twenty years or more away. Both feel, however, that this may prove an outstanding contribution to long-range forest planning in the south. The total direct cost of the project—including tract management, fertilization, and cost accounting—is being assumed by the Escambia Chemical Corporation. The Forest Service will be responsible for measurement of tree growth on plots, statistical analysis, and the periodic reports which are to be made public.

Crop Chemicals To Save Timber

Insects are the cause of 7 tree deaths to 1 by fire, according to Dr. James Beal of the US Forest Service. Crop chemical spray from the air is combating this problem, but more research is needed to develop more effective chemicals for the purpose, he says.

Selling to Specialized Markets

Those who grow commercially ornamentals, flowers and such other highly specialized and highly profitable crops cannot ever afford to "let the soil take care of itself." They are a good, steady market—well worth developing.

AMS Surveys Nursery Industry In Five States

by Robert A. McGregor

For the first time, the nation's nursery industry has definite information on marketings in five representative States.

Agricultural Marketing Service, at the request of the industry, has just made a pilot survey of the sales of eight classes of nursery products in five selected States in 1956.

Commercial nurserymen believe that from these and later statistics on sales and relative popularity of the eight classes of nursery products will come valuable information on today's marketing techniques. The data should provide a good sampling of production and marketing practices.

The report, the first of its kind to be issued by the Crop Reporting Board, covers commercial sales in California, Colorado, Florida, Illinois, and Iowa.

In January, another survey started for five additional States—Michigan, Ohio, Oregon, New York, and Texas—and further information will be collected in the five States originally checked.

The nursery products included are conifers, broad-leaved evergreens, deciduous shade trees, deciduous shrubs, rose plants, deciduous fruit and nut trees, grape vines, and citrus and subtropical fruit trees.

The overall value of these products in the five States last year was $32 million. Broad-leaved evergreens accounted for the largest single share, with sales of $7.3 million. Second came rose plants with sales of $6.3 million; third, conifers, $5.6 million; then, citrus and sub-tropical fruit trees, $4.4 million; deciduous fruit and nut trees, $3.7 million; deciduous shade trees, $2.6 million; deciduous shrubs, $2 million; and grape vines, $0.3 million.

Only plants produced by the nurserymen were counted in the survey—that is, only those grown or bought and held by producers for 1 or more seasons. Plants and trees purchased and sold within a single season were not considered grown by the producer; therefore, they were not included.

Approximately 11 million broad-leaved evergreen plants were grown and sold in the five States in 1956. Sales of citrus and sub-tropical fruit trees were estimated at 3 million; conifers at 3.5 million plants; deciduous fruit and nut trees at 6.5 million; deciduous shade trees at 1.4 million; deciduous shrubs at 3.8 million plants; rose plants at 15.3 million; and grape vines at 3.7 million.

California, with 1956 sales for the eight classes estimated at almost $20 million, led the five States. Next came Illinois, $5 million; Florida, $4.5 million; Iowa, $2.5 million; and Colorado, $0.4 million.

These values represent gross returns to commercial producers for all sales at the wholesale level. Retail sales were converted to an equivalent wholesale value by using the average wholesale prices reported for each State.

Data came from about two-thirds of the commercial producers in the States surveyed. These growers accounted for over 94 percent of the total sales estimated for the eight classes in the five States.

A commercial producer was defined as one who produces and sold nursery products valued at a minimum of $1,000 in 1956. By this definition, Florida had 628 commercial producers; California, 577; Illinois, 229; Iowa, 61; and Colorado, 35.

For the five States, nursery stock available for sale in 1957 exceeded 1956 sales by 55 percent for broad-leaved evergreens; 41 percent for citrus and sub-tropical fruit trees; 39 percent for conifers; 19 percent for deciduous fruit and nut trees; 57 percent for deciduous shade trees; 66 percent for deciduous shrubs; 50 percent for grape vines; and 10 percent for rose plants.

AMS, however, warns marketing people not to consider these figures as forecasts of 1957 sales. Carryovers each year are rather substantial, and the wastage of bare root stock for some plants and trees is often high.

On the basis of 1956 sales, conifers sold the best in Colorado and Illinois; roses in California; citrus and sub-tropical fruit trees in Florida, and deciduous shrubs in Iowa.

Outside and inside views of Northern California Fertilizer Company's modern home.

Builds Business On Florist Needs

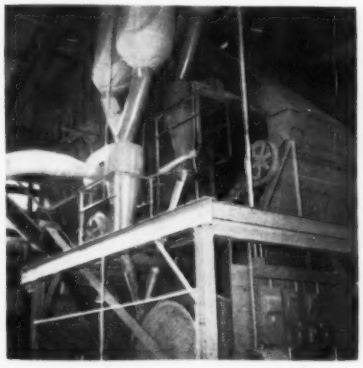
by WALTER B. BALCH

The Northern California Fertilizer Company has moved into its new modernistic plant in San Jose, Calif. The plant built on the seven-acre tract was laid out exactly to Owner Y. B. "Bones" Bepp's specifications. It is as streamlined and up-to-date as money can make it, every square foot of the 20,000. The most modern fertilizer mixing equipment has made it possible to boost production to 1000 tons per day.

The success of Bepp's firm is a record of achievement in developing the specialized fertilizer needs of the multi-million dollar florist industry on the San Francisco peninsula. His salesmen have been schooled from their first working day on knowing precisely what every florist needs for his floral specialities and how to work, experimentally if necessary, with every customer until the right analysis has been compounded for every need.

The Northern California Fertilizer Company caters to two classes of growers, the strawberry and flower growers. Strawberries are an outdoor crop, as are many varieties of flowers, but Bepp's staff has special fertilizer formulas worked out for varieties grown under glass, plastic, and cheesecloth. The company's specialization extends the full depth of the organization, from warehousemen to salesmen.

The new field, which the Northern California Fertilizer Company is developing with sweeping success, is that of catering to lawnkeepers. Bepp learned that few fertilizer companies would mix up a few tons of a special mix. So he simply adjusted his prices for special mixes in small several ton quantities and has been walking off with the lion's share of the trade.



Customers will pay premium prices, and pay gladly, he has found. The customers want definite and certain results and will stick like glue to the firm that can deliver such materials. The garden maintenance men, who devote all of their working time to keeping up lawns and shrubs, are contacted. Samples of soil are taken to the company and tests worked out until the Northern California Fertilizer Company has the precise formula for that specific need. Bepp calls it "custom-made fertilizer." A few extra dollars invested in a specific formula can make all the difference.

Bepp began his career as an odds-and-ends boy in the cut flower business in San Francisco and became familiar with the operations of exporting and importing flowers and the retail business of selling them. Here he was faced with the problems of growing and marketing.

The flower growers had an urgent and vital need for the right fertilizers to be available at the right time in terms of the growing season. Credit was not easy to obtain in a field dealing with a product as fragile as flowers. Bepp obtained the backing of a number of growers in the area and opened his business in an old building that gave him 6,000 square feet on which to operate. There were the problems of sacking fertilizer mixes, and in the days prior to the advent of the fork lift.

But Bepp is doing all right now—as the new building indicates.

Golf Courses In '57 Exceeded All Expectations

In December we published some statistics on golf courses which came to us from the National Golf Foundation. A more recent report, dated January 7 shows that even the record breaking figures in the preliminary report were exceeded by the final facts: 185 new courses opened for play; 320 under construction; 833 in the planning. Think of the plant food they need!

U of C and CFA Sponsor Courses

The University of California is sponsoring a Soils and Plant Nutrition Extension Course during January, February and March, according to the California Fertilizer Association. This course will be open to fertilizer salesmen, dealers, agriculturalists, and, in fact, to all persons interested in soil fertility and plant nutrition.

The course will be given on the Davis campus of the University of California, and in Modesto. At Davis, the course started on Tuesday evening, January 14, and will end on Thursday evening, February 20. At Modesto, the course will start on Tuesday evening, February 4, and will end on Thursday evening, March 13. The lectures are scheduled for Tuesday and Thursday evenings from 8:00 to 10:00 o'clock, for periods of six weeks.

Fertilizer Dealers Met At Lincoln

The eighth annual Nebraska fertilizer dealers' conference was held at Lincoln January 14, 15 and 16.

Exhibits of fertilizers, agricultural chemicals, equipment for handling these materials and farm implements and machinery were on display January 15 and 16.

Three out-of-state speakers talked on fertilizer use and the soil conservation value of fertilizers.

University of Nebraska staff members discussed fertilizer placement and solutions, water solubility of phosphates, new and mixed fertilizers, and the use of fertilizers in establishing grass and legume seedings.

Spencer Demonstration Plant Gives

ADVANCE ANSWERS TO MIXERS

Is the day coming when a fertilizer mixer, gearing up to produce a high-analysis product with conventional equipment, can "look up" most of his process answers thereby reducing costly trial and error experimentation?

"It's not impossible" is the word that comes from Spencer Chemical Company's Jayhawk Works where, for the past year, many mixer problems have been studied in a newly-constructed mixed fertilizer demonstration plant.

Operation of the plant, a conventionally equipped, ammoniator-granulator set-up on a "pilot" scale has been under the direction of the company's technical department since last June. Completed in February of last year, the plant was "checked out" by Spencer's research and development division and then turned over to the technical department for the study of mixer problems.

"We're trying to develop as much 'know-how' as possible about solving common mixer problems," says Ralph Miller, head of the company's technical department. "Producing high analysis mixed goods with conventional equipment is, of course, a problem which many mixers are tackling now or may soon have to tackle. Some of the answers we're trying to develop on this include: Production costs, using various available raw materials; formulas, production rates with standard equipment and physical properties of the finished material. "We even go so far as to run storage tests to check mechanical condition," Miller says. Among the ratios which are being studied with a view toward learning how they can profitably be increased to the so-called "high" analysis level are: 1-1-1, 1-4-4, 1-1-0 and 1-4-0.

The word "demonstration" in the unit's title means just that. "Being able to show a mixer how to do it is much more effective than writing or telling him how to do it," says W. A. McPherson, project chemist at the unit. Spencer has indicated that it intends to make broad distribution of all information on improved processing techniques and data just as soon as they are proven to be valuable on a commercial scale.

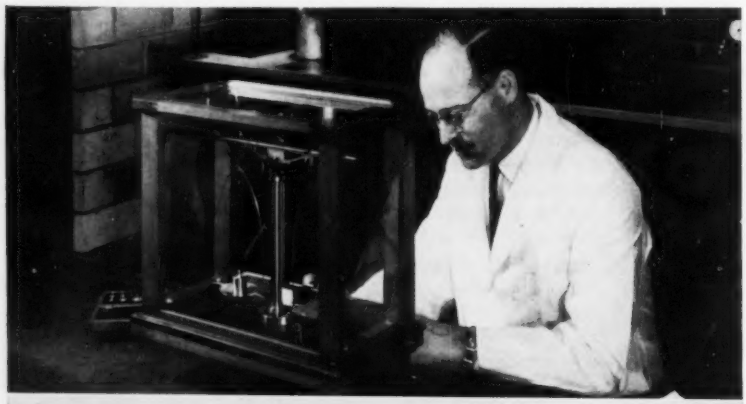
A promising development from the work at the mixed fertilizer demonstration unit is the effort to solve the sparger corrosion problem. According to Miller, "The work to develop a better sparger has been almost a full-time project involving everything from metallurgical studies to engineering design. We now have what we think is not only an improved sparger from the standpoint of corrosion resistance, but a design which will give better distribution." He indicated that the new sparger is currently undergoing commercial testing and that results with its use so far had been encouraging.

In other phases of the work at the demonstration unit, headway has been made in granulating "troublesome" grades such as 5-20-20 and 6-24-12. Data is also being accumulated on the use of phosphoric acid in granulation. How best to lick the fume "nuisance" plaguing the industry has also been studied at the demonstration unit and word is awaited on the commercial evaluation of a fume removal unit developed there.

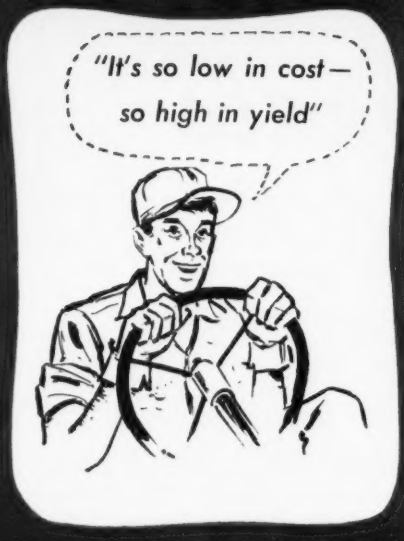
New Inhibitor For Solutions Is Tagged 'Spensol Greeen'

The corrosion "headaches" of every mixed fertilizer manufacturer may have been eased somewhat this month with the announcement of a new line of ammoniating solutions by Spencer Chemical Company. Significant reduction in the corrosion caused by these solutions is being claimed by Spencer in introducing SPENSOL GREEEN. According to Spencer, the new line of solutions contains an improved inhibitor which will show definite advantages in cutting corrosion and prolonging the life of conventional steel equipment. Laboratory tests so far have indicated that the inhibitor used in the new solutions results in at least 40 per cent less corrosion than any of the more than 150 inhibitors being tested. This includes the inhibitor being used in Spensol solutions up until the introduction of Spensol Greeen.

Weight loss by corrosion is being determined here by a chemist at Spencer Chemical Company's corrosion testing laboratory. This measurement is part of a test which measures the amount of corrosion loss caused by ammoniating solutions. The test was perfected in the Spencer laboratory during 12 years of research on corrosion inhibitors. In recent tests an improved inhibitor, now being used in Spencer's new Spensol Greeen solutions has indicated at least 40 per cent less corrosion damage than any of the more than 150 inhibitors which have been tested. Elements used by Spencer in testing the corrosiveness of ammoniating solutions are shown. The pressure pan holds an ammoniating solution containing a corrosion inhibitor. Test plates of mild steel with a weld bead in the middle are immersed in the solution and held under constant pressure for seven days. The test plate at left is of lighter color indicating corrosive attack by the solution in which it was immersed. The plate at right has a dull color, indicating less corrosion effect. The plates are weighed before and after immersion for the exact measurement of weight loss.

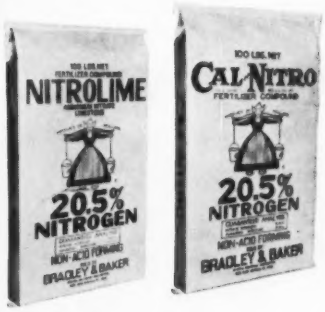


THE SMARTEST FARMERS DEPEND ON...



NITROLIME · CAL-NITRO

TRADE MARK REG. U.S. PAT. OFF.



NON-ACID FORMING

"Hear your crops grow with Nitrolime or Cal-Nitro"

District Sales Offices:
ATLANTA, GA. • NORFOLK, VA.
INDIANAPOLIS, IND. • ST. LOUIS, MO.

Top-yield farmers count on

NITROLIME and **CAL-NITRO** for

Fast-acting Double Nitrogen Feeding • Economical Application
Easy Machine or Hand Application • Better, Longer Storage
Neutral Soil Reaction • Resistance to Leaching • Biggest Plant Yield

THE IDEAL NITROGEN FERTILIZER

Profit-minded dealers across the country depend on NITROLIME and CAL-NITRO for steadier fertilizer sales. Contact your local Bradley & Baker representative today for complete details.

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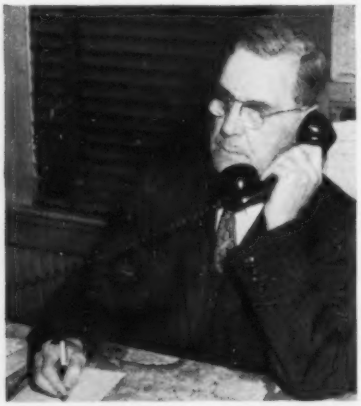
Personals

DALTON JOINS AAC RESEARCH

Dr. Joseph D. Dalton has joined the research department of The American Agricultural Chemical Company. He will participate in the firm's continuing fertilizer research program.

John L. Day, who retired January 1 after 43 years with Farmers Cotton Oil Co., Wilson, N. C. He is succeeded by E. R. Bridger, who has been with them since 1932.



Frank M. Bennett who has joined the agricultural chemicals department of Commercial Solvents Corporation as a sales representative, it has been announced by Clyde T. Marshall, department manager. He will make his headquarters at CSC's District Office, 49 Central Avenue, Cincinnati, O.

Warren M. Gannon, who has been made salesmanager of the Western district, of the St. Regis multiwall packaging division. He succeeds Thomas J. Fleischman, who has been made manager in charge of sales and production for the division, succeeding the late Robin G. Swain.

45-YEAR WOOD LEAVES ROYSTER

J. M. Wood, completing 45 years of service with F. S. Royster, has retired from his post as general superintendent. He was honored by fellow officers at a luncheon and presented a silver bowl. He will make his home in his native state, Alabama, at Tuscaloosa.

McNEIL RETIRES FROM MISS. COOP.

Charlie McNeil has announced his plans to retire as general manager of Mississippi Federated Cooperatives, a position which he has filled for the last 23 years, effective March 1.

Ernest G. Spivey of Jackson has been named as Mr. McNeil's successor, and A. E. Beall of Jackson was promoted from the position of organization director to assistant general manager.

The board of directors accepted Mr. McNeil's resignation "along with an agreement that he would accept a position as management consultant for the state-wide farm-business organization."

RAYMOND BAG CORP. PROMOTES MERS, CLEMENTS

F. D. Gottwald, president of Albemarle Paper has announced the following changes in the executive organization of the firm's Raymond Bag Corporation Division at Middletown, Ohio:

Clarence L. Mers, who has been president of the Raymond Division since its incorporation two years ago, has been elected chairman of the board. He joined the original Raymond Bag Company in 1922.

J. R. (Jack) Clements, who becomes the new president at Raymond, has been associated with the bag industry for some 24 years. He joined Albemarle in 1952.

John E. Fletcher, who—January 1—became vice-president and salesmanager of the US Potash Company division of US Borax and Chemical. Earl H. Miller, not shown, became vice-president and resident manager in Carlsbad, New Mexico of the same division and on the same date.

ROBERTSON HEADS SPENCER RESEARCH

Dr. Nat C. Robertson as general manager of research and development for Spencer Chemical Company was announced by Kenneth A. Spencer, president. Dr. Robertson will assume his new responsibilities February 15. He succeeds Dr. John R. Brown, Jr., who resigned in November.

STAUFFER ON CONFERENCE BOARD

Hans Stauffer, president of Stauffer Chemical, has been elected a board member of the National Industrial Conference Board. Mr. Stauffer is also a director of Greyhound Corporation, Western Phosphates Inc., Montrose Chemical Company of California, Philadelphia Quartz Company of California, San Francisco Chemical Company, Cornwall Chemicals Ltd., and Old Hickory Chemical Company.

STAUFFER APPOINTS GOODLING TO WORK VA.

Richard A. Goodling has joined Stauffer Chemical Company's Northeast agricultural region as a technical field representative covering the south and central areas of Virginia, it is announced by Dan J.

Loy A. Everett who has been named assistant sales manager of Commercial Solvents Corporation's agricultural chemicals sales department, according to an announcement by Clyde T. Marshall, sales manager of that department. He will make his headquarters at the New York Office.

Keating, vice president of the agricultural chemicals division. Mr. Goodling will make his headquarters in North Garden, Va., and will report directly to the New York City office.

STAUFFER'S BIGELOW RETIRES TO FLORIDA

William H. "Tex" Bigelow, one of the best known chemical salesmen in the Midwest, has retired and moved to Florida. "Tex" has been associated with the sales department of Stauffer Chemical Co. for the past 28 years. He is now living at 805 Camellia Drive, Harbor Bluffs, Largo, Fla.

GENTRY NAMED MANAGER ARK. FEDERATION PLANT

Arthur N. Gentry has been named manager of the Arkansas Plant Food Company plant at North Little Rock, following the death of M. D. Broadfield, December 23. He has been with them since 1949 as plant superintendent.

MONSANTO MAKES PERSONNEL CHANGES

Monsanto Chemical has transferred J. G. Rotramel to Columbus, O. as crop chemicals sales representative, and has widened the duties of Herbert J. Ploch as technical sales specialist.

IM&C NAMES SURGENT MOVES HEUERMAN

Basil M. Surgent has been named an agricultural sales representative in the potash division of International Minerals & Chemical Corporation, will cover New York, New Jersey, Pennsylvania, Maryland and Delaware.

He succeeds Robert A Heuerman, who will be the company's potash sales representative in Quebec province, the New England states, Virginia, Baltimore and New York City.

E. W. Harvey, one of the pioneers in the introduction of nitrogen solutions has retired after 39 years with Nitrogen Division. He is going to devote full time to managing his fruit and dairy in Cream Ridge, N. J.

DREWRY TO SOUTH FOR IM&C

Judson H. Drewry has been named Southern area salesmanager for the phosphate minerals division of International Minerals & Chemical, with Atlanta as headquarters. He has been working out of Louisiana in their potash division since 1949. Atlanta offices are at 1325 Fulton National Bank Building.

TACKE JOINS CAL-SPRAY

The appointment of Frederick A. Tacke as a California Spray-Chemical Corporation plant maintenance engineer, has been announced by Frank J. Juchter, Calspray's manager of manufacturing. Mr. Tacke will perform maintenance engineering at the Richmond Fertilizer and Pesticide Plants.

HEFLER ELECTED V. P. BY A. P & C.

Richard J. Hefler has been elected vice president, finance, of American Potash & Chemical Corporation, according to an announcement by Peter Colefax, company president.

Mr. Hefler joined American Potash & Chemical Corporation in 1948.

THOMAS PRESIDENT BATTELLE MEMORIAL

Dr. B. D. Thomas, scientist and research administrator, has been named to the presidency of Battelle Memorial Institute to succeed Dr. Clyde Williams, whose retirement as president was announced recently.

Active head of Battelle since being named director a year ago, Dr. Thomas has been a member of the Battelle organization for many years. He joined the staff as a research engineer in 1934, was appointed Assistant Director in 1942, and Vice President in July 1955.

Arthur G. Riddell, Jr., who has recently joined Bradley & Baker as a sales representative in the Middle West in their fertilizer department. He will cover the states of Illinois, Indiana, Ohio and Wisconsin. Mr. Riddell, who will make his home in St. Louis, Missouri, was formerly associated with the bag division of Virginia-Carolina.

Announcement has been made of the retirement on December 31st of Burton B. Fall, senior vice president of The Hubbard-Hall Chemical Company. Mr. Fall was President of The Rogers & Hubbard Company of Portland, Connecticut at the time of its merger on January 1, 1957 with three other fertilizer Companies to form The Hubbard-Hall Chemical Company. He has been associated with the fertilizer industry for forty-three years. He had planned retirement a year ago, but on the urgent insistence of the other members of the firm stayed on for an additional year to assist in the organization of the new Company. He will remain on the board of directors of The Hubbard-Hall Chemical Company.

F. Herbert Mackay, formerly with Olds & Whipple, has joined Hubbard-Hall Chemical Co., Waterbury, Conn. He will work on production control with emphasis on tobacco fertilizers, and when Hubbard-Hall enter the nitrogen solutions distribution field, Mr. Mackay will assume direction of this operation. With Olds & Whipple he was vice-president and treasurer, and in charge of production and materials purchasing. He is a grandson of the founder, the late Frank H. Whipple.

W. Delmer Murphy, Jr., who has been assigned as sales representative for Du Pont nitrogen products in Michigan, Wisconsin, and the Chicago area. He joined the Du Pont Polychemicals Department in 1956 as a market analyst.

Sackett Equipment
PAYS ITS OWN WAY
ASK THE MEN WHO USE IT

GET THE RIGHT ANSWER TO YOUR PRODUCTION PROBLEMS get Sackett

SACKETT

THE A. J. SACKETT & SONS CO.
1727 S. HIGHLAND AVENUE
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LINSON AND MacLEAN TO WOODWARD & DICKERSON

E. V. Linson and L. MacLean have recently joined the staff of Woodward & Dickerson, Inc., Philadelphia, Pa. Both are well known in foreign and domestic trade, with a number of years experience handling fertilizers, feed stuffs, and chemicals.

US STEEL PROMOTES DOCZY

The appointment of Joseph S. Doczy as manager of sales for the Pittsburgh district of the coal chemcial sales division of United States Steel was announced by Charles W. Baldwin, general manager of the division. Mr. Doczy began his association with U. S. Steel in 1952.

HEFLER UPPED BY WORTHINGTON

Richard E. Hefler Jr. has been appointed sales manager of the industrial mixer section of Worthington Corporation's Plainfield, New Jersey, division. The announcement was made by Paul J. Foley, manager of Sales for Plainfield division. Mr Hefler joined Worthington in 1953.

GRODEN SUCCEEDS TURNER AT INTERNATIONAL PAPER

Joseph A. Groden has been named Eastern Regional Sales Manager of International Paper Company's Bagpak Division, it was announced by A. A. Scholl, Division General Manager.

Mr. Groden has been associated with International Paper since 1940. He succeeds the late Lee Turner, who died December 23 following an operation.

CYANAMID PROMOTES COULTER, BERRY

G. L. Berry, manager of the Welland plant of North American Cyanamid Limited since 1952, has been appointed manager of manufacturing for the phosphates and nitrogen division of the parent firm, American Cyanamid Company.

F. S. Washburn, president of North American Cyanamid Limited, said the appointment becomes effective February 1. Mr. Berry succeeds J. Ray Coulter who has been named manager of manufacturing for American Cyanamid Company's industrial chemicals division.

JENSON HEADS ARIZONA AREA FOR O.M.

Elmo Jenson has been promoted to area sales supervisor, southern Arizona, for the plant food division, Olin Mathieson Chemical Corporation, L. S. Madsen, district general manager, announced.

GRACE CHEMICAL APPOINTS AUGHTRY

Grace Chemical Company Division of W. R. Grace & Co., has appointed Dr. J. D. Aughtry, Manager of Agricultural Services to its main offices in Memphis, Tennessee.

DR. KUDER DIRECTOR OF BEMIS RESEARCH

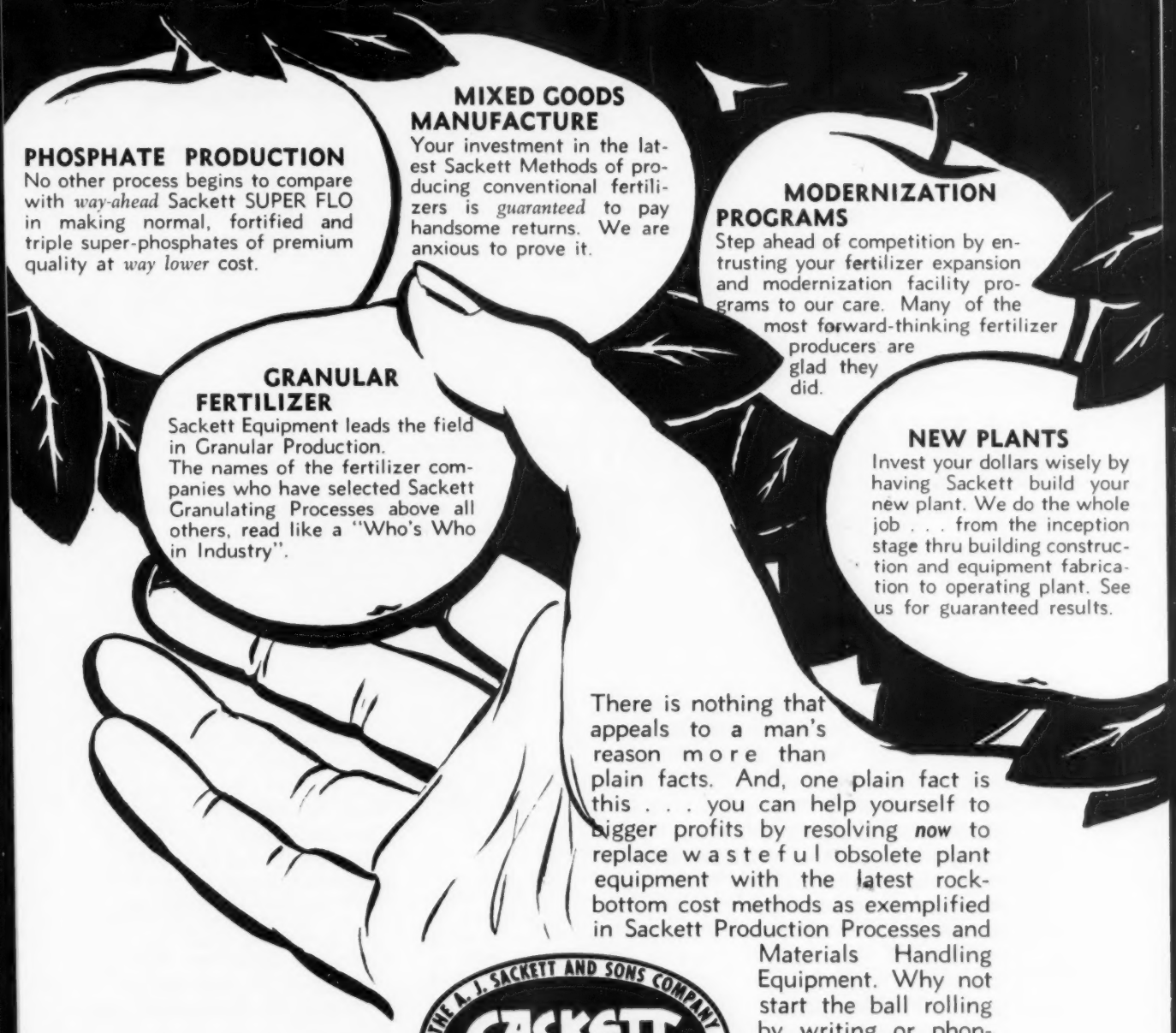
Bemis Bro. Bag Company has announced the appointment of Dr. Robert C. Kuder as Technical Director of the Bemis Research Laboratory, Minneapolis. The position is a newly-created one made necessary by continued expansion of the Bemis research program.

TWO ADDED BY VELSICOL

B. Gene Carter is a member of the Velsicol Chemical Corp. sales staff in the Midwest, working Ohio, Kentucky, Michigan, West Virginia and western portions of Pennsylvania and New York. Bernard Willis, with headquarters in New York, will handle liaison with US suppliers for worldwide distribution for Velsicol International which has its base in Nassau, the Bahamas, and markets outside the US a complete line of insecticides, also industrial resins and solvents.

The Chase Bag Company Paper Bag Division has announced appointment of three new territory Sales Managers: Left to right—P. E. Nelson, Southeastern sales manager in Atlanta; Bill Sheets, Midwestern sales manager in Chicago, and K. L. Moore, Eastern sales manager in Buffalo. Mr. Nelson joined Chase Bag in 1938, Mr. Sheets last year, and Mr. Moore joined the firm in 1956.

HELP YOURSELF TO BIGGER PROFITS



PHOSPHATE PRODUCTION
No other process begins to compare with *way-ahead* Sackett SUPER FLO in making normal, fortified and triple super-phosphates of premium quality at *way lower* cost.

MIXED GOODS MANUFACTURE
Your investment in the latest Sackett Methods of producing conventional fertilizers is *guaranteed* to pay handsome returns. We are anxious to prove it.

MODERNIZATION PROGRAMS
Step ahead of competition by entrusting your fertilizer expansion and modernization facility programs to our care. Many of the most forward-thinking fertilizer producers are glad they did.

GRANULAR FERTILIZER
Sackett Equipment leads the field in Granular Production.
The names of the fertilizer companies who have selected Sackett Granulating Processes above all others, read like a "Who's Who in Industry".

NEW PLANTS
Invest your dollars wisely by having Sackett build your new plant. We do the whole job . . . from the inception stage thru building construction and equipment fabrication to operating plant. See us for guaranteed results.

There is nothing that appeals to a man's reason more than plain facts. And, one plain fact is this . . . you can help yourself to bigger profits by resolving *now* to replace wasteful obsolete plant equipment with the latest rock-bottom cost methods as exemplified in Sackett Production Processes and Materials Handling Equipment. Why not start the ball rolling by writing or phoning us today?

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SACKETT
EQUIPMENT
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Architects and *Manufacturing* Engineers to the Fertilizer Industry Since 1897.

America's Foremost *Creative* designers & Builders of Commercial Fertilizer and Superphosphate Plants . . . Related Production Equipment

CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

STATE	December		November		July-Sept. Qtr.		January-June		July-December		YEAR (July-June)	
	1957	1956	1957	1956	1957	1956	1957	1956	1956	1955	1956-57	1955-56
Alabama	------	14,371[1]	27,918	33,110	76,674	73,433	808,900	872,550	174,707	165,867	983,607	1,042,416
Arkansas	------	8,555[1]	------	7,485[1]	44,923	33,156	265,265	299,172	59,915	60,299	325,150	359,471
Georgia	45,239	49,063	78,061	88,232	100,432	84,808	980,824	988,454	253,559	250,968	1,234,383	1,244,422
Kentucky	------	7,036[1]	------	6,444[1]	38,972	38,271	451,083	441,481	90,284	91,478	541,367	529,600
Louisiana	6,449	8,295	7,100	12,740	31,773	24,150	200,277	217,343	71,129	59,345	271,406	273,688
Missouri	31,484	30,887	21,963	32,870	188,293	177,012	460,487	444,230	331,343	356,241	791,830	800,471
N. Carolina	------	43,325[1]	25,323	43,644	72,305	67,264	1,300,353	1,324,267	216,234	225,182	1,516,587	1,649,449
Oklahoma	2,426	2,470	1,965	6,489	29,832	25,166	52,836	65,854	54,509	69,542	107,345	135,396
S. Carolina	20,270	23,216	19,905	24,993	48,486	43,019	694,571	743,670	122,929	119,947	817,500	863,617
Tennessee	6,000	8,298	30,036	36,476	69,431	58,205	383,457	378,626	165,796	154,260	549,253	532,886
Texas	33,144	31,736	20,452	44,411	109,118	71,437	392,770	372,695	202,406	193,704	595,176	566,399
California	(reports compiled quarterly)				216,479	181,386	663,484	639,377	412,747	361,615	1,079,748	1,001,554
Virginia	(reports compiled quarterly)				74,379	75,566	600,158	599,111	154,075	162,709	754,223	761,820
Indiana	(reports compiled semi-annually)						781,268	807,981	305,917	255,131	1,087,185	1,063,049
Iowa	(reports compiled semi-annually)						------	315,329[1]	85,147	130,000	------	445,329[1]
Michigan	(reports compiled semi-annually)						------	443,908[1]	184,763[1]	*	------	*
New Hampshire	(reports compiled semi-annually)						15,730	13,168	3,253[1]	*	18,983[1]	*
Washington	(reports compiled semi-annually)						------	103,885[1]	55,709	48,749	------	152,674[1]
Connecticut	(report issued annually)										------	76,660[1]
Oregon	(report issued annually)								62,147[1]	*	------	*
TOTAL	145,012	153,965	232,724	322,965	1,101,097	952,873	8,051,463	8,207,979	2,756,406	2,705,037	10,654,760	10,824,238

------(not yet reported) * Not compiled [1] Omitted from column total to allow comparison with some period of current year.

MARKETS

ORGANICS: Demand for fertilizer grade organic ammoniates continues good and producers of Nitrogenous Tankage are in well sold position. One major producer reports being booked up through March. Current prices range from $3.12½ to $4.00 per unit ammonia bulk, f.o.b. producer's works depending on location of producer.

SEWAGE SLUDGE: Chicago material continues at $3.10 per unit Ammonia and 50¢ per unit APA bulk, f.o.b. Chicago works. Houston material is at $2.75 per unit Nitrogen and 50¢ per unit APA f.o.b. Houston, bulk, carlots.

CASTOR POMACE: Supply position is more comfortable than formerly with imported material arriving recently and domestic production up slightly. Price for domestic is reported around $40.00 per ton bagged f.o.b. northeastern production point.

DRIED BLOOD: Unground bagged Blood is indicated in the Chicago area at $6.00 per unit Ammonia and in the New York area at $4.50 to $4.75. Use is primarily for feed.

POTASH: Movement continues in rising seasonal dimensions. Prices continue at previously announced levels. Supply is adequate from domestic sources supplemented by imports at Atlantic ports.

GROUND COTTON BUR ASH: Supply and demand continue in good balance. Recent new rates to the Southeast for minimum 50 ton cars help lower the delivered unit K_2O cost.

SUPERPHOSPHATE: Prices continue steady and movement to mixers beginning to rise in volume as the season progresses. Supply position is good.

AMMONIUM NITRATE LIMESTONE: Prices continue at previously announced level of $49.75 per ton in bags and $45.75 in bulk, f.o.b. cars or trucks at South Atlantic and Gulf ports; also f.o.b. Hopewell, Va. Movement is rather small at this writing but expected to rise rapidly in Febuary.

AMMONIUM NITRATE: Production continues steady and demand tending to rise in the Southeast particularly. Prices are $72.00 per ton bagged and $68.00 bulk f.o.b. production points although one producer indicated $70.00 bagged and $66.00 bulk f.o.b. southeastern origin.

GENERAL: Due to bad weather conditions, the freeze damage in Florida, the effect of the Soil Bank on farm operations, many fertilizer manufacturers in the Southeast particularly, are not very optimistic regarding volume figures for the season. These factors have also delayed movement of mixed fertilizer considerably to date.

"Race With Famine" Lowdermilk Says

Walter C. Lowdermilk, soil conservation specialist from Berkeley, Cal., who has just returned from a United Nations assignment in Isreal and Yugoslavia, spoke recently in Portland, Ore., on the "population bomb" that is making civilization run a race with famine . . . "the outcome is in doubt" he said.

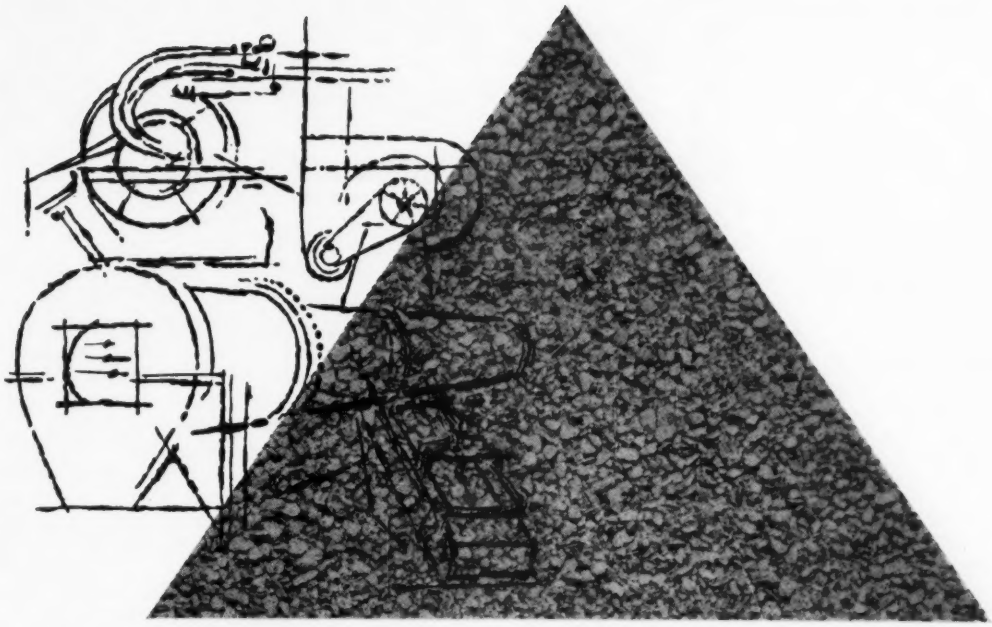
His point was butressed by these figures: From 1650 to 1950 world population grew from 500,000,000 to 2,500,000,000—and by the year 2000 will be 5,000,000,000, at the present rate. He believes that the 4,000,000,000 acres of tillable land in the world can support that many people only by rehabilitation of the large areas which have become depleted and eroded due to poor agricultural practices.

They Must Love The Fire-Ant

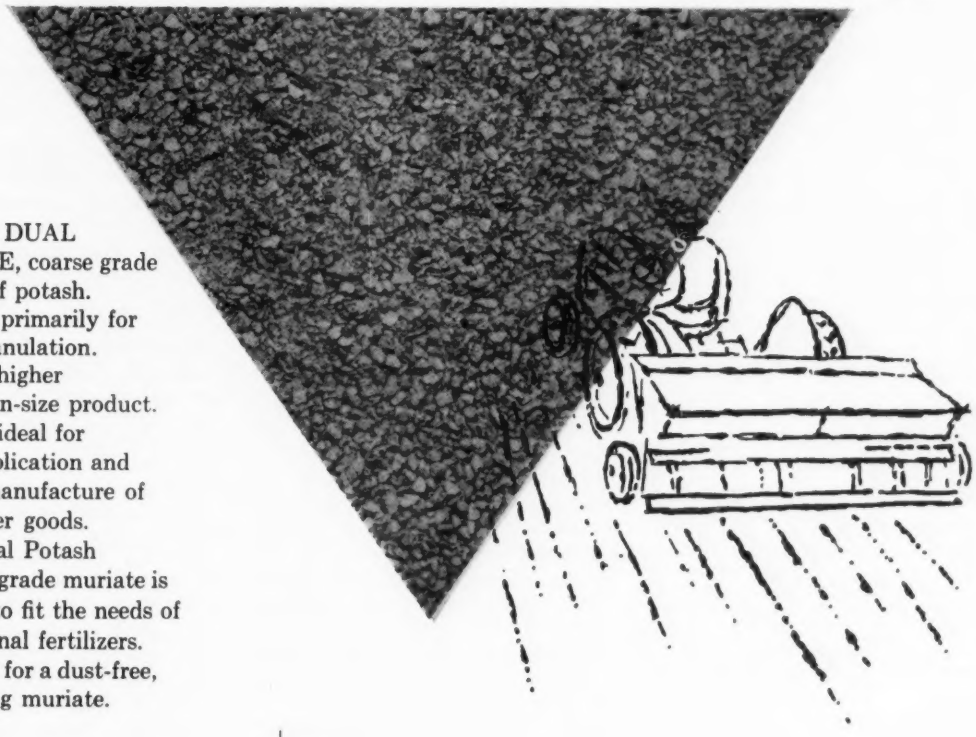
Not only is the National Audubon Society bucking the use of crop chemical sprays to eradicate the fire ant, but now we read of three Harvard biologists who also object. Of course, the fire-ant has not yet reached that far North.

The National Wildlife Federation has also gotten into the act with a protest—based as are the others on the idea that wide-spread use of sprays may also eradicate birds, animals and some useful insect life. This, in turn, could bring on more trouble than the fire-ant, they protest.

One wonders, however, if any of these objectors have ever been bitten by a fire-ant . . . or broken his farm equipment on a fire-ant mound.



LET NATIONAL POTASH SERVE YOU



Here is a DUAL PURPOSE, coarse grade muriate of potash. Designed primarily for use in granulation. It gives a higher yield of on-size product. It is also ideal for direct application and for the manufacture of top dresser goods.

National Potash standard grade muriate is designed to fit the needs of conventional fertilizers. Processed for a dust-free, non-caking muriate.

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212 Bell Building • MONTGOMERY, ALA. • AMherst 5-8234

CALIFORNIA

Chemical & Pigment Co., Oakland, having completed its new plant for the production of 36% zinc sulphate, has announced that Wilson & Geo. Meyer & Co. will be exclusive sales agents for the new Meteor product, as it has for other Meteor products since the early 1930's.

IOWA

Davis Liquid Fertilizer held open house last month at their new Vinton plant, which mixes 20 hourly tons.

KENTUCKY

National Carbide is about to put $2,000,000 into a unit, to be added to its Louisville plant. This will reclaim from the huge pile of waste lime sludge, byproduct of their carbide operation.

LOUISIANA

Freeport Sulphur has bought a shore base in Grand Isle, 50 acres that will augment is Gulf of Mexico mining operations.

MARYLAND

Wm. B. Tilghman Co., Salisbury, in its charming little house organ, "The Tiller" has a quote that is very quotable. It is credited to Dr. Knapp, father of cooperative farm and home demonstration work: "A country home, be it ever so plain, is nature's university, and is more richly endowed for the training of youth than Yale or Harvard."

* * *

First Mississippi Corp. will build a plant at Pascagoula, to be operated by Coastal Chemical and designed to turn out 70,000 annual tons of concentrated sulphuric. Alongside will be another plant of the same size, of which Coastal will absorb 20,000 tons, the remainder going into the open market.

MISSOURI

Boss Fertilizer, Moberly, expect to be in operation March 1 with their liquid fertilizer production plant, designed by Indian Point Farm Supply, with a capacity of 150 daily tons. A new concern, the owners are Gordon Burnam, Jake B. Overfelt, Howard Sims, Henry Schumann. They will also handle a complete line of dry mixed fertilizers.

NEW JERSEY

DuPont reports that one of the three new production units to be built at its Repauno Works will produce hydrogen and anhydrous ammonia.

NEW YORK

Axon Chemical and Fertilizer Corp., New York City, has been chartered with 200 shares of no par value. Papers were filed by the Prentice Hall Corporation System, 90 Broad St., New York 4.

NORTH CAROLINA

Ahoskie Fertilizer Co., has been incorporated at Ahoskie, with $100,000 of capital stock. S. S. Pierce, Luther Powell and P. A. Lewis are listed as incorporators.

OHIO

F. S. Royster were planning to have in operation by the time this is published their $500,000 fertilizer plant at Piqua, which is a wood building 180 x 400 feet, 44 feet high and will employ 40 to 60 persons. A $1,000,000 granulating plant is to be built on the same site later on.

OREGON

Chapman Chemical are in the midst of a $170,000 alteration and expansion program in their Portland crop chemical plant. The plant will soon go from three to four-shift operation, and from a five day to a seven day week.

* * *

Balfour Guthrie & Co., Portland, are doing a major face-lifting job on their offices,—new paint job, fluorescent lighting and all.

SOUTH CAROLINA

Molony Fertilizer, who have been building a $30,000 bagging and shipping facility at their Charleston plant since last November, were expecting completion this month, according to John C. Molony, president.

TEXAS

Caprock Fertilizer Co. is building a $200,000 fertilizer plant at Littlefield. It will be geared to produce 30,000 annual tons of fertilizer, will produce its own superphosphate. It is owned and operated by Longhorn Construction Co., Sulphur Springs, who specialize in fertilizer plant construction. The plant will be operated by Pat Gowan, with "Pete" Stultz as salesmanager.

VIRGINIA

Smith-Douglass, Norfolk, ran in the January issue of Progressive Farmer magazine what the publication says is the largest single full color "spectacular" ever run in a consumer publication for a fertilizer manufacture. It occupied 4 pages in the million-circulation magazine and introduced "Tomorrow's Fertilizer Today" a complete new line labelled Square Deal. Thousands of dollars of cash and prizes were to be announced in local newspapers and on radio and TV, as the Square Deal Sweepstakes. One line in the advertisement reads "More plant food guaranteed". The fourth page emphasized tobacco fertilizers.

AUSTRALIA

Australia and New Zealand, whose present phosphate deposits will be worked out in 35 years, at present rate, are making a determined search for new deposits in the South Pacific.

CANADA

Dominion Fertilizers Ltd., through its general manager, Erol Beker, has just announced the details of Canada's largest and most modern superphosphate plant to be erected at Port Maitland, Ontario, on a 22 acre site.

"Construction is scheduled for completion by the beginning of the summer of 1958. This will enable the plant to supply the superphosphate requirements for the next fertilizer season.

"The plant will be most ideally and centrally located to supply not only Canada's needs, which are being imported to a large extent today, but also to supply areas in the United States bordering Lake Erie.

"The plant will be located at the mouth of the Grand River leading into Lake Erie. It will have all possible transportation facilities, including direct rail service to its property, year-round roads leading to main highways and its own deep water wharfage.

"The capacity of the plant will be sufficiently high not only to take care of the quantities presently imported into Canada but also to supply Canada's future needs for its ever growing use of the product.

Coastal Chemical Corporation recently adopted two new package designs for its fertilizer plant in Pascagoula, Mississippi. The $7,500,000 plant is now producing various grades of pelletized, water-soluble high analysis fertilizer. Owen Cooper, executive vice president of Coastal Chemical, is shown with one of the "Coastal Brand" bag designs created by Union Bag - Camp Paper Corporation.

"Superphosphate will be produced both in powdered and granulated form.

"The plans of the company also include the production of large quantities of wet process phosphoric acid. Plans also embrace the production of the industrial chemical derivatives of phosphoric acid, which are used in many industries.

* * *

International Minerals & Chemical has authorized spending an additional $8,300,000 on its Saskatchewan potash mine, the final total cost of which is expected to be around $20,000,000 by the time it is in operation in 1959.

PERU

Fertisa expect to have their Synthetic nitrogen fertilizer plant at Callao in operation this year, with 50,000 annual tons output.

TRINIDAD

Grace & Co. engineers are making preliminary tests prior to starting construction on their $15,500,000 plant, **Federation Chemicals, Ltd.** to convert natural gas into fertilizers for West Indies, Central and South America.

EGYPT

Egyptian Chemical Industries, having virtually exhausted its original $23,000,000 capital is now attempting to raise another $23,000,000. The Aswan fertilizer plant, on which this money is being spent is being constructed by German and French firms.

changes

National Petro

National Petrochemicals, which has been partly owned by Panhandle Eastern Pipeline, becomes a wholly owned subsidiary of National Distillers, via exchange of Panhandle's 40% Petro stock for N-D stock.

Jefferson Lake

Jefferson Lake Sulphur's financing of Canadian projects via Gairdner, Canadian investment house, may take the form of a separate Canadian corporation.

Cyanamid

First of the year, Cyanamid's international operations were consolidated into Cyanamid International, a division under the direction of Sidney C. Moody, vice-president and director of the company.

Fulton Bag

Having sold its branch bag manufacturing plants at New Orleans and St. Louis, Fulton Bag and Cotton Mills will concentrate its textile bag and related cotton specialty production in Atlanta, according to president Clarence Elsas.

The branch plants were bought by a new corporation, The Fulton Bag & Products Co., which will produce and sell multiwall bags and other paper, textile, burlap, canvas, brattice cloth bags and other products. Jason Elsas is president of the new concern.

Calunite

Calunite Corp. has been acquired by Hydrocarbon Chemicals, and its Pomona Cal. fertilizer plant will be operated as a wholly owned subsidiary. Expansion plans are in the making.

NPFI

National Plant Food Institute has opened its Western Office at 550 Kearny Street, San Francisco 8, Cal. Phone YUkon 2-8173. As reported in our December issue, Richard B. Bahme is in charge of this office.

Dow

Dow Chemical has moved its New Orleans sales office to 1100 Commerce Building, New Orleans 12, La. Phone TUlane 0206.

Richardson

Richardson Scale Company has announced still another new district sales office, this one at Boylston Center, Mass., with Joe Vogel as district manager. The office is on Sewall St. The phone number is Underhill 9-2856.

AP&C

American Potash & Chemical has opened a Great Lakes-Midwest territorial office in Chicago, with John L. Anderson as manager, and two sales representatives — Edward C. O'Connor and Wallace O'Dowd.

Sole Chemical

Sole Chemical Corp, Chicago, has named Hukill Chemical Corp., to serve their surfactants as technical sales representatives for Ohio, western Pennsylvania, and the southern half of Michigan.

Retzloff

Retzloff Chemical Company, Almeda, Texas, has just announced the following assignments of sales representatives for its agrichemical emulsifiers:

Industrial Chemical Company—Issaquah, Washington will serve the states of Washington, Oregon and Western Idaho.

F. M. Speekman Company—San Francisco, California will serve Northern California

W. G. Wunderly—Pasadena, California will serve Southern California

Vulcan Sales Company—Mission, Kansas will serve the states of Iowa, Kansas, Missouri, Nebraska and Oklahoma

Hukill Chemical Company — Cleveland, Ohio will serve the states of Ohio, Southern Michigan and Western Pennsylvania

Latane Lamb, sales manager of the Texas Surfactant producing firm, stated that this is the first move to extend the present marketing area of Texas and the Delta States.

Diversey

Diversey Corp. has acquired the Wilson Chemical Co. of Honolulu and will operate it as a division of their Hawaiian subsidiary. It will serve as a blending and compounding center for agricultural chemicals.

OBITUARIES

William Albert Barr, 64, of Dill Fertilizer & Fuel, Greenville, S.C., suddenly January 2. He had been with the concern and its predecessor, Southern Cotton Oil, for 30 years.

C. Dudley Clawson, 55, president, Ferro Corporation, January 4 from a heart attack, while visiting a subsidiary in Mexico.

C. W. Loomis, retired director and vice-president of Bemis Bro. Bag Company, December 19, after nearly two years illness.

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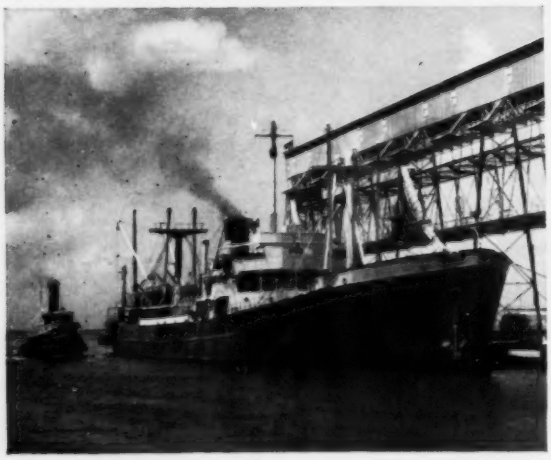

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Nitrogen is the growth nutrient that builds big, healthy productive plants. And Lion brand Ammonium Nitrate fertilizer, containing 33.5% nitrogen, supplies *two* important kinds of plant nitrogen . . . quick-acting and long-lasting . . . to give your plants a fast start *and* maintain steady growth.

Test your soil to learn how much nitrogen and other plant foods you need for your crops. Then figure how much and what kind of fertilizer is necessary to supply these needs. Your local agricultural advisors will help you.

Apply the full amount of proper mixed fertilizer and Lion brand Ammonium Nitrate your soil test indicates. Don't skimp—fertilizer is the least-expensive item you use for crop production.

See the results when your crops get all the nitrogen they need for peak yields. You'll be glad you used low-cost, Lion brand 33.5% nitrogen fertilizer. Look for the Lion on the bag at your favorite fertilizer dealer.

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• • •

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ANNOUNCING NEW

After accelerated testing with new SPENSOL GREEEN, there is practically no corrosion at the weld! The sandblasted surface of the test strip is unmarred.
After accelerated test with an old-fashioned ammonium nitrate solution, the solution had already started to eat through the weld!
PELOUZE MFG. CO. EVANSTON, ILL. U.S.A.

The scales show the difference in corrosion damage. The metal panel on the right was immersed in an ammoniating solution containing the best inhibitor on the market up to this time. The panel on the left was immersed in SPENSOL GREEEN. Both panels were sandblasted first to remove mill scale and expose parent metal. Both were tested for the same length of time. But SPENSOL GREEEN is so much less corrosive that the panel on the right lost more than one and a half times as much weight as the SPENSOL GREEEN panel on the left.

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Ralph Miller
Technical Director
Spencer Chemical Company

Spencer Technical Director Ralph Miller reveals . . .

How New SPENSOL GREEEN Can Double The Life of Storage Tanks, Sparger and Distribution System:

NOW, for the same price you have been paying for any leading brand of ammoniating solution, you can have an ammonium nitrate solution that can cut your equipment replacement costs in half and eliminate most of the down-time caused by corrosion!

The ammonium nitrate solution is Spencer Chemical Company's new SPENSOL GREEEN. New SPENSOL GREEEN contains a special inhibitor that is at least 40% more effective* than other corrosion inhibitors now being used! This means that new SPENSOL GREEEN can greatly reduce corrosion problems.

Think of The Savings in Equipment Costs

No need to replace carbon steel storage tanks every three to five years! Carbon steel storage tanks, sparger, pipe lines, fittings, etc., last nearly *twice* as long when new SPENSOL GREEEN is your ammonium nitrate solution!

Think of The Savings in Reduced Down-Time

When you use SPENSOL GREEEN, you take an important step toward ending production hold-ups caused by corroded lines in the distributing system!

As you know, delays and down-time can be mighty costly this time of year with the busy season at hand. But with SPENSOL GREEEN, you have *extra* assurance of keeping production at the top level of efficiency!

No Changes in Your Mixing Process

You use SPENSOL GREEEN the same way you would use any ordinary ammonium nitrate solution. SPENSOL GREEEN can be added to the ammoniator, whether your plant is set up for continuous production or a batch process operation!

Since the basic specifications and mixing properties of SPENSOL GREEEN have not been changed, the handling, measuring and metering are the same as they were with SPENSOL before SPENSOL GREEEN was developed!

Will Not Change Color of Your Fertilizer

Although SPENSOL GREEEN is a definite green color, it will not change the color of your finished product.

Available in all SPENSOL grades, SPENSOL GREEEN comes to you at no increase in price!

Why Settle for Less Than New SPENSOL GREEEN?

So why buy ammonium nitrate solutions that give you less corrosion control, when new SPENSOL GREEEN costs you no more?

Switch to SPENSOL GREEEN and see the difference in increased life of equipment, *plus* big reductions in down-time!

For more information, write, wire or phone Spencer Chemical Company at the address that is nearest you.

●

*As measured by the comparative weight loss of 2" x 3" mild steel test plates, each containing a weld bead. There is no standard test for corrosion, but this method gives accurate, reproducible results.

Insist on SPENSOL GREEEN (Spencer Nitrogen Solutions)

SPENCER CHEMICAL CO., Dwight Bldg., Kansas City 5, Mo., District Sales Offices: Atlanta, Ga.; Chicago, Ill.; Memphis, Tenn.; Kansas City, Mo.; Works: Pittsburg, Kans.; Chicago, Ill.; Henderson, Ky.; Vicksburg, Miss.; Orange, Tex.

RESEARCH RESULTS & REPORTS

What Research Has Done For Florida Farm Costs

This material from Florida's Extension Service says in few words what agricultural research has done for Florida's farmers. At the same time it gives a clear and concise "how-to-do" program for the farmer who wants to operate profitably. Actually, it is a part of the fertilizer industry's own "selling" program.

Nowadays abundance of food is taken as a matter of fact in Florida. Our people don't have to worry where their next meal comes from. Florida farmers are feeding millions more persons than they did 20 years ago and on the same acreage. And they're doing it with fewer workers.

Initiative, adaptability and know-how are why we can do this. It means that we are using science to aid us in the problem of production plus. It means that farmers are using ideas that come from research.

Agricultural researchers at the University of Florida gear their search for facts to the needs of the rancher and grower. Agricultural research has become a part of modern farming.

The reason farmers turn to scientific methods is to trim their productive costs. A farmer, as does every businessman, has to figure carefully to come out ahead. The cost-price squeeze is the major problem of the farmer. No longer is he striving to produce two blades of grass instead of one—but to produce two bushels as cheaply as he used to produce one.

Science has taught the farmer that the surest thing to do to come out ahead is to reduce the cost of each unit of commodity grown. No matter what price he had hoped for, the hard fact is that at harvest time crops and livestock often sell at a lower figure.

Every Florida farmer knows the importance of fertilizer. But he may not know what his county agent or soil scientist is able to discover through a soil test. With little effort he can get an exact prescription showing the fertilizer and lime needs of every field on his farm, regardless of the crop grown. By following these scientific recommendations, our Florida growers can cut costs and thus earn more money. This is only one example of the cut cost approach.

Just paying the fertilizer bill is quite a drain on agricultural profits. Yet, without fertilizer there would be no profits. The scientific approach is to use the right kind and in the right amounts to make the profit.

The progress of our farmers over the years has meant more abundance and larger incomes for all of us. Farmers and the state as a whole should look to its future through agricultural research.

research briefs

Research by USDA has been further expanded with the establishment of two special pioneering labs and several more to come. Each is staffed by a group organized around outstanding scientists, and their job is to pioneer into the unknown realms of agronomic science. The two now operative are at Beltsville, as will be the three more which are chartered.

♦

Liquid fertilizers and solid, applied to identical test plots in Kentucky, produced equal wheat yields within one bushel per acre . . . 17 bushels, while the check plot produced only 8. Each test area was fed—per acre—60 pounds of nitrogen (30 in fall; 30 in Spring); 40 of phosphorus; 60 of potash.

♦

Starter fertilizers should not be forgotten, says the U of Minnesota. Bulk spreading is fine, but don't sell starter short. Applied with the seed at planting time, starter fertilizers often give the farmer a better return per dollar spent than any other kind of fertilizer application.

Water is saved by the use of fertilizer, the Midwest Soil committee relays from North Dakota tests. There, it "took less water to produce more bushels of wheat in fertilized than in unfertilized land"... which is a pretty compact sentence, but clear if you read it twice.

♦

Irrigation in combination with timed harvests and fertilizer use doubled the beef-producing potential of high-elevation meadows in Colorado that have been under study for seven years. Heavy Spring nitrogen applications, with intermittent irrigation, did the trick. This study stressed again the point made more and more often lately that irrigation and fertilizer must go hand in hand for the irrigation to be fully effective.

♦

Soil tests are mighty important, as has most recently been demonstrated in Minnesota. When the rates of plant food were out of line with the soil tests, the added plant food was of no practical advantage.

♦

Gibberellin has broken through the Elberta peach barrier! After years of making artificial weather, and trying many other tricks in an effort to have Elberta peaches grow somewhere other than Georgia, and ripen for Winter consumption, and after failing, even in the most well-equipped greenhouse and laboratory experiments, little old Gibberellin came to the rescue and did the job for a couple of North Carolina State experimenters.

♦

Interseeding of alfalfa and other forage crops between corn rows continues to look promising in Minnesota field tests. This gives the farmer a forage crop without the need for an intermediate "nurse" crop of oats. It takes wider rows, hence less corn yield per acre, but is evidently worth it.

♦

Boron, thought of these days mostly as a rocket fuel, is now rescuing prune trees from an ailment called "bushy branch," which turns out to be a boron deficiency. Trees sprayed last year with a borax solution pro-

duced up to 10 times as many prunes as a group of untreated check trees.

♦

Lupine that is not bitter, and may be the answer to all-year grazing in the Gulf states has come over from Sweden and is being tried out by USDA and Georgia's Tifton AES. It is called Borre Sweet Blue Lupine. Crossed with other plants, it is now producing a distinctive seed by which substitution can be detected, a weak point in the original plant.

An interesting sidelight on this: Cattle won't feed where 5% of the plants are bitter. Thrips won't injure a bitter plant. So the AES picked heavily thrip-injured plants, and bred them. Just like that!

♦

Glycerine added to nutritional plant sprays increase the plant's absorbtion of phosphorus, potassium and other minerals. Check the University of Pennsylvania biological abstracts, Sept. '57 for details.

♦

Virus diseases of insects, which can be readily applied to the infested field can control pests as well as chemical pesticides, New York's Cornell AES reports. They know five virus approaches now which are more or less independent of temperature and humidity, hence can be spread at the time they are needed.

♦

Weevil food, especially prepared, has helped the laboratory grow a good supply of weevils of known age, antecedents and previous condition of servitude. It may also turn out to be good bait to lure weevils to destruction. USDA and Texas AES are doing the research on this.

♦

2-4-D as a hormone or growth stimulant is a switch that has been developed by U. S. Rubber on its Malayan and Indonesian rubber plantations. Over 5 years of tests they have found it raises latex yields as much as 40%, has rejuvenated old trees and added years to their productive life. Perhaps Geritol can be used as an insecticide, just to keep things balanced up!

♦

Bees are being saved from the effects of insecticide sprays, by the introduction of a sulfide that repels them and keeps them away for 8 to 48 hours. Now tests are being made in the Oklahoma AES at Stillwater to be sure the repellant does not affect seed or fruit production.

Expect 1000 At February 20-22 Nitrogen Conference In St. Paul

About 1,000 farmers, fertilizer manufacturers, fertilizer dealers and soils research workers are expected to attend a Nitrogen Conference Feb. 20-22 at the Lowry hotel in St. Paul, Minn.

Sponsored jointly by the Minnesota Fertilizer Industry committee of the Midwest Soil Improvement committee and the University of Minnesota, the conference will feature a roundup of the latest information on nitrogen fertilizer use.

The conference will be keynoted Thursday, Feb. 20 by M. H. McVickar, chief agronomist for the California Spray Chemical Corporation, Richmond, Calif. He will talk on the question, "How can we work as a team to put soil fertility facts to work on the farm?"

Following an address by Harold Macy, Dean of the University's Institute of Agriculture, a panel of University men, commercial representatives, a banker and a farmer will discuss "Our part in getting the job done."

Speaking on this panel will be W. P. Martin, head of the University soils department; Roland Abraham, assistant director of the Minnesota Agricultural Extension Service; Proctor Gull, chief of agronomy development section for the Spencer Chemical Company, Kansas City, Mo.; H. E. Hartzier, Manhattan, Kans.; Les Boler, farmer near Winnebago, Minn.; and Dick Bird, banker at Red Wing.

An evening open house will be held Feb. 20 in the new University soils building, which is expected to be completed by that time.

The keynote speaker for the Friday, Feb. 21, session will be George D. Scarseth, director of the American Farm Research association, Lafayette, Ind., who will discuss "Nitrogen—our big need." "Nitrogen, soil organic matter and soil structure" will be discussed by George Blake, University of Minnesota soils researcher.

"Nitrogen and the life of the soil" will be the topic for a talk by E. L. Schmidt, University soils scientist, and John Grava, supervisor of the University's soil testing laboratory, will explain "Nitrogen availability measurements in soils."

Visitors to the conference will be admonished "Don't forget phosphorus, potash and lime," by A. C. Caldwell, soils research worker.

"Crop production possibilities for Minnesota soils" will be viewed by Charles Simpkins, extension soils specialist at the University, and Edmond Hartmans, extension farm management specialist, will talk on "The economics of production potentials."

A panel on "The role of nitrogen potentials" will be a feature of the Feb. 21 afternoon session. Speakers will be J. M. MacGregor and P. M. Burson, University of Minnesota soils scientists; R. A. Young, soils research worker from North Dakota Agricultural college and M. R. Teel, agronomist from Purdue University.

Laurie Peterson, Midland Cooperative, Inc., will speak on "Industry's program for getting the job done in Minnesota."

The conference will wind up with a tour of the St. Paul Ammonia Products Nitrogen Plant south of the Twin Cities Saturday morning, Feb. 22.

Newly-appointed National Plant Food Institute regional personnel when they met in Washington, D. C., to study and become more familiar with Institute operations, and to confer with staff members on the expanded research and education program of the Institute. Shown with Dr. Russell Coleman and Paul T. Truitt (seated left to right) Institute executive vice presidents, in the accompanying photo (standing left to right) are: Zenas H. Beers, who will be Midwest regional director; Dr. W. H. Garman, chief agronomist and Northwest regional director; Dr. Samuel L. Tisdale, Southeast regional director; F. Todd Tremblay, Pacific Northwest representative; Dr. Richard Bahme, California and Arizona representative; and Dr. Robert L. Beacher, Southwest regional director.

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TVA COMMITTEE OF 11 REPORTS ON ITS RECOMMENDATIONS AFTER 10 MONTH SURVEY

Tennessee Valley Authority has made public the report of a group of eleven consultants concluding an intensive ten-month survey of TVA's distributor demonstration program involving the distribution of fertilizer for educational purposes.

This fertilizer educational program operates in 31 states in cooperation with the land-grant colleges of those states. Under the program, fertilizer produced in experimental and demonstration plants at TVA's Fertilizer-Munitions Development Center, Muscle Shoals, Ala., is sold to selected private and cooperative wholesale distributors of fertilizer. These distributors have contract arrangements with TVA which require them, in marketing this material, to undertake educational activities designed to introduce improved fertilizers to farmers; encourage the use of fertilizers for selected fertilization practices recommended by the college but which are not yet widely accepted by farmers; and utilize the fertilizer themselves to experiment and up-grade fertilizers presently available in their trade area.

The committee of eleven members included three educational specialists in agricultural economics, statistics, and public administration; four land grant college agronomists; and four representatives of distributors of TVA fertilizers. They are:

Earl O. Heady (chairman), professor of Agricultural Economics, Iowa State College; R. J. Jessen, professor of Statistics, Iowa State College; W. R. Parks, professor of Public Administration, University of Wisconsin; M. D. Weldon, extension agronomist, University of Nebraska; J. C. Lowery, extension agronomist, Alabama Polytechnic Institute; M. B. Russell, head of Agronomy Department, University of Illinois; N. C. Brady, head of Agronomy Department, Cornell University; John Sims, consultant, Ohio Farm Bureau Cooperative Assn.; Arthur M. Smith, assistant to the vice president, Plant Food Division, Olin Mathieson Chemical Corp.; Howard Parker, president, Sylacauga Fertilizer Co.; and Howard Thullbery, sales manager, Superior Fertilizer & Chemical Co.

Information for making the evaluation was obtained by conducting a field survey of the 24-state area receiving 95 percent of all TVA fertilizers for the Distributor Demonstration Program in calendar year 1956, base year for the study. Survey data were collected by the Field Survey Unit of University of North Carolina and processed by the Statistical Laboratory of Iowa State College. Individual members of the committee supplemented the survey data through personal interviews with participants in the TVA program, members of the fertilizer industry and others, along with study of additional facts supplied by TVA at the committee's request.

Recommendations

The recommendations which follow relate to the initial phase of the evaluation assignment; namely, suggestions for improvement of the Distributor Demonstration Program within the framework of currently defined objectives. In other words, the objectives are considered to be fixed, but the program procedures and means of attaining the objectives are considered to be flexible, or subject to change. This was the major initial assignment given to the Evaluation Committee by TVA administrative officials. Recommendations might well be different if the objectives themselves were subject to change.

The Committee recognizes that the main elements of the current program were formulated during the war when national defense considerations were paramount and it was highly desirable to increase output of fertilizer materials. It was in the national interest that TVA facilities continue to be used to manufacture as much fertilizer as was feasible in the postwar period. Demand and need for fertilizer exceeded production capacity of the Nation during the remaining period of the 1940's; a period when a high level of agricultural output was vitally needed to help meet the world's food shortages. In a similar manner, fertilizer needs exceeded production capacity in the first part of the 1950's, during and following the Korean conflict. The point in time when this situation would be relieved could not be predicted accurately in the world situation of the last decade.

TVA administrative officials were wise in extending details of the current program through the period when it was vitally needed from the standpoint of national defense and world needs. The existing distribution program for TVA fertilizer materials resulted in mutual benefits to farmers, the public, and the fertilizer industry during this period. It helped provide more food in order that the nation could better meet its world obligations and aid in attaining world political stability. It provided more fertilizer materials so that farmers could increase their income. By extending education on fertilizer to encourage farmers to use new types and forms of fertilizer, to use fertilizer on new crops,

NOMINATIONS OPEN FOR WILEY AWARD

Frank A. Vorhes, Jr., President of the Association of Official Agricultural Chemists, has announced that nominations are now being accepted for the second annual Harvey W. Wiley Award for achievement in analytical methods. This award, which consists of $500 in cash, goes to the scientist who makes an outstanding contribution to the development of methods of analysis for foods, drugs, cosmetics, feeds, fertilizers, and pesticides, or for use in general analytical chemistry.

Nominations must be submitted by April 1, 1958. Nominees need not be members of the association. A general statement regarding the award may be obtained from the Secretary, William Horwitz, Box 540, Benjamin Franklin Station, Washington 4, D. C.

LET'S NOMINATE SOMEONE FROM OUR FIELD

and to use more fertilizer more efficiently, it contributed a gain, both immediate and potential, in the demand for commercial fertilizer. It was evidently for the foregoing reasons that TVA administrative officials extended the established program on into the 1950's — a period when demand continued to exceed production capacity and the established pattern of distribution generally coincided with public needs. Not until the recent past did fertilizer production capacity begin to exceed fertilizer demand. However, with the recent change in fertilizer and agricultural situations, at a rate which could not be predicted in respect to production capacity relative to demand, TVA administrative officials are to be commended in asking for an evaluation of the Distributor Demonstration Program, with a view to adapting it for prospective needs of the farming and fertilizer industries and the American public. (See letter from Dr. Allbaugh in a foregoing section of this report.)

The Committee's recommendations, therefore, represent changes to allow the Distributor Demonstration Program to conform more nearly to needs of the current situation and the outlook for the farming and fertilizer industries. Recommendations for strengthening and improving the Distributor Demonstration Program, within the currently defined objectives of an education program, follow:

I. Responsibilities in Use and Distribution of TVA Materials

1. **Qualified farm uses for TVA materials should be clearly of an educational nature and should be defined more rigorously and exactly.**

This step is necessary if the Distributor Demonstration Program is to be justified largely in terms of its educational contributions in the introduction of new materials, in the lessening of plant food costs to farmers, and in increasing the efficiency of fertilizer use. A more precise definition of special use which are educationally justifiable is an activity which merits an important and an intensified investment of TVA staff time, in cooperation with the Land Grant colleges and Extension Services. Although this activity has been conducted continuously in past years, the current situation suggests the need for a more complete and more detailed review of the special-use program.

2. **Educational activities should be evaluated and supported on the basis of their merits in education, without regard to plant production capacity.**

The Committee emphasizes that the educational program should be determined by educational needs at the dealer and farmer levels, and not by capacity or break-even volume of TVA fertilizer production facilities. Fiscal and administrative distinction should be made between fertilizer manufactured and used for educational purposes and that manufactured for attaining "break-even" points, for financing research on materials, or for other purposes.

3. **The pricing policy should be consistent with the educational objectives of the program.**

Procedures should be established which will prevent in all cases, at the dealer or distributor level, any facet of the Distributor Demonstration Program from becoming simply a method of underpricing competition, or for attaining tie-in sales, etc. If TVA should produce fertilizer which falls either outside of, or in addition to, educational objectives defined in the Distributor Demonstration Program pricing policies in the different programs should be entirely distinct.

4. **Aside from responsibilities in the Tennessee River Watershed, the geographic spread of materials should be extended and the concentration at particular locations should be decreased.**

While TVA materials in total make up only about 1.6 percent of the particular materials used in some areas. Therefore, precise limits should be established, to control concentration in particular geographic areas. State quotas should be established for materials distributed in the Distributor Demonstration Program. A quota might be, for example: TVA materials in quantities which do not exceed 5-10 percent of the state's consumption of the particular nutrient or 15 percent of the particular carrier, except when new carriers have been developed by TVA. State consumption would be measured in terms of the most recent three years for which statistics are available. If other bases are used for lessening geographic concentration, they should be in terms of the relative educational needs of individual states.

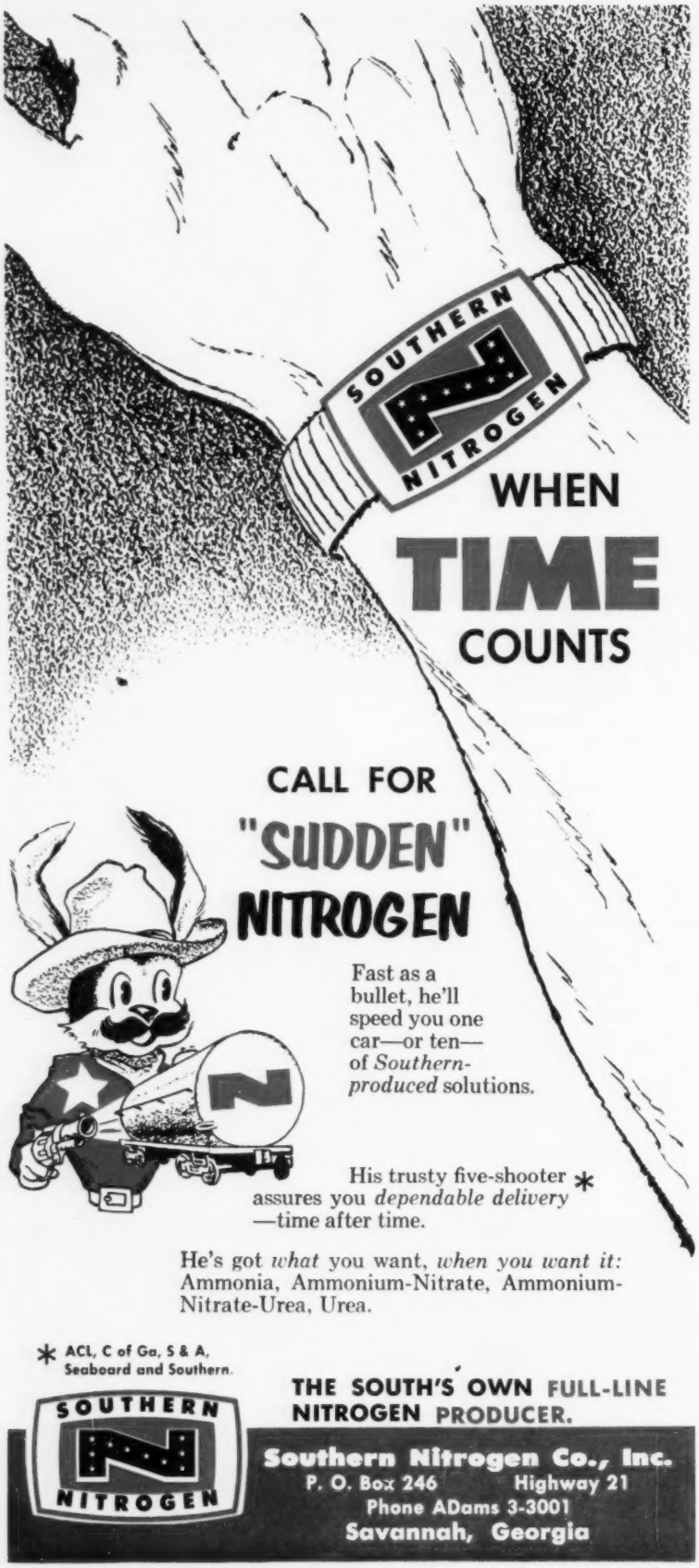
5. **More exact upper limits should be established for the quantity of TVA materials distributed to individual farmers.**

These limits should be reasonable and should be defined in terms of educational needs of particular states, areas, and farms. They should be set up after consultation with the Land Grant colleges and they should be strictly enforced.

6. **Limits should be established for the length of time for which (1) a newly developed material should be included in the Distributor Demonstration Program, and (2) an individual farmer can obtain fertilizer for a particular special use.**

A suggested time limit is eight years for inclusion of a newly developed material in the Distributor Demonstration Program and three years for a single special use of a particular material on a particular crop by an individual farmer.

Robert W. Andrew (center), a student in agronomy at Ohio State University, Columbus, was winner of the National Plant Food Institute's 1957 Agronomy Achievement Award. Shown with Mr. Andrew are: Dr. Garth W. Volk, (right), Chairman, Department of Agronomy, Ohio State University, and Z. H. Beers, (left), Midwest Regional Director of the Institute. Mr. Andrew is from Clermont County, Ohio and will graduate in June of 1958. He plans to continue his studies for a Master and Ph D. degree and is interested in teaching. The presentation was made at the annual Ohio Fertilizer and Lime Conference held in Columbus, at the New State Office Building, on December 13, by Mr. Beers. The award is presented annually to an outstanding Ohio State Junior student majoring in agronomy, and is based on scholarship, character and leadership. It carries a cash prize of $200 and an engraved key. Each annual winner's name is engraved on the plaque shown above. The plaque is on display in the offices of the Agronomy Department at Ohio State.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Savannah, Georgia

7. **All advertising and promotional efforts by distributors and dealers which relate to TVA fertilizers should mention and emphasize both the TVA materials and the special uses for which they qualify.**

This requirement is designed to prevent "bargain sales" of TVA materials for non-educational uses. It should be closely enforced.

8. **Emphasis on close-growing crops, cover crops, and those grown for soil conservation purposes should be intensified and an increased proportion of TVA materials should be allocated to and used for these crops.**

The use of TVA materials should be encouraged in all areas on close-growing crops, whether they be permanent cover or grown in rotation systems. It is suggested that the fertilization program for these close-growing crops can best be carried out by expanding cooperation with the Land Grant Colleges and the agencies listed in recommendation III-6.

9. **TVA should not use fertilizers in the Distributor Demonstration Program which are inferior in quality to those commercially available to the farmer.**

A material with objectionable handling qualities, such as TVA's current ammonium nitrate, should not be distributed under a long-run educational program emphasizing new and improved materials.

II. Responsibilities in State Program and of Wholesale Distributors and Retail Dealers

A. PROGRAM CLARITY

1. **Program terminology should be clarified and stabilized.**

The exact objectives and nature of the program should be more easily identifiable in respect to: Qualified fertilizer practices or special uses on farms in individual states or groups of states; use of TVA materials in mixed fertilizers; required procedures and agreements between distributors and dealers and between dealers and farmers.

2. **Individual state programs should be written in more concise and specific terms.**

Currently, some state programs are written in such general terms that the program is hard to identify and the impression is conveyed that a few demonstrations qualify the dealer to distribute the remaining TVA material according to his own judgment. State programs should be reviewed and/or revised annually or more frequently in cooperation with the Land Grant Colleges.

B. RECOMMENDATIONS FOR WHOLESALE DISTRIBUTORS

1. **Written agreements between wholesale distributors and retail dealers should be required.**

These written agreements should provide the basis for implementation of the Distributor Demonstration Program. They should define the requirements for dealer participation and the records and other mechanisms to be used by dealers in attaining compliance with program requirements. A copy of the agreement form should be sent to TVA by the wholesale distributor.

2. **At least annually, distributors should review the program with each of their dealers and formulate plans for the ensuing year.**

A report of these reviews and plans should be sent to TVA.

3. **The wholesale distributor should be required to provide to the retail dealers, annually or more frequently, written instructions on new materials and special uses for TVA fertilizers.**

The written instructions also should explain the procedures to be used in distributing TVA materials. These instructions should be reviewed and brought up to date annually. TVA should have annual evidence that the wholesale distributor has provided this written information to his retail dealers.

4. **Each distributor should report to TVA annually on the destination and use of all TVA materials.**

These reports should state the amount of each TVA material used in mixed fertilizer and the amounts going to individual dealers. The analysis of mixed fertilizers in which TVA materials are used also should be reported.

5. **The use in mixed fertilizers of TVA materials of types readily available commercially should be discontinued in the Distributor Demonstration Program.**

Use of TVA materials not readily available from commercial sources for upgrading mixed fertilizers should be by specific agreement with TVA.

6. **TVA should strengthen its procedures for the detection of program violations and their prompt disposition.**

Serious or chronic violations should result in cancellation of the distributor's contract with TVA. Fertilizer shipments to the distributor should cease promptly.

7. **The distributor should be responsible for the compliance of his dealers with the regulations of the Distributor Demonstration Program.**

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In case of program violations, the wholesale dealer should divorce the retail dealer from the program and cease shipments of TVA materials. Fieldmen of TVA should ascertain that compliance is accomplished.

8. **Each distributor should be required to designate to TVA the personnel responsible for administration of the Distributor Demonstration Program.**

The purpose of this recommendation is: To insure that agreements and information are forwarded to dealers; to provide TVA with proper records and documents; to follow up on records and compliance by retail dealers; to insure that an adequate educational program is implemented, etc. Wherever feasible the last responsibility should be vested in a trained agronomist.

C. RECOMMENDATIONS FOR RETAIL DEALERS

1. **Retail dealers should be required to keep readily available and accurate records of amounts, kinds of materials, and names of farmers to whom TVA materials are sold.**

Dealers should be given the choice of using their own record forms, approved by TVA, or appropriate record forms supplied by TVA. It is recommended that wherever possible all distributors participating in a state endeavor to agree on the record forms furnished their dealers.

2. **Each farmer should be required to sign a statement indicating his intended use of TVA fertilizers in the manner specified by the list of qualified uses.**

Special forms might be used for this purpose, or TVA might furnish each dealer a special stamp to be used on the sales slip which would be signed by the farmer.

3. **At the time of or before each purchase of TVA materials, the dealer should provide the farmer with a copy of special uses for which each material qualifies.**

4. **Every dealer should be strongly encouraged to increase his educational activities with farmers by providing more printed material, holding more demonstration meetings, encouraging soil tests, and working with local educational personnel.**

5. **The retail dealer must restrict the total quantities of TVA materials sold to any one farmer or for any one special use, in accordance with the quantity and time limits specified in the program for his state.**

6. **An award and recognition system should be considered for farmers who have successfully used TVA materials, in accordance with the state program, for a period of three years.**

7. **All advertisements of TVA materials by the retail dealer must mention TVA and the special-use program.**

The main emphasis in advertisement and promotion of TVA materials should not be price advantage.

III. Adjustments in Administrative Machinery and Procedures

1. **The kinds and amounts of fertilizer needed for the educational program should be determined by the Division of Agricultural Relations.**

This determination should be made after consultation with Land Grant Colleges on educational needs. Instructions to produce the kinds and quantities of materials required for an educationally-based Distributor Demonstration Program should be forwarded then to the Office of Chemical Engineering. Personnel engaged in the program relating to the educational objectives mentioned above should not be required to define special uses designed for distribution of an amount of fertilizer determined for other objectives. If manufacturing volume for a particular material is defined under another objective, determined within TVA, and if this volume is in excess of the kinds and amounts of materials needed for the educational objective, distribution of this excess should be through different administrative procedures than those established for the educational objective. The distribution methods used should not interfere with the educational aspects of the Distributor Demonstration Program. In this case, justification of the material and its quantity should be in terms of financing product research, and not — to the extent that volumes for the two objectives do not coincide — in terms of educational objectives. Industry officials are generally favorable to conduct by TVA of research on new methods and products and to TVA distribution of fertilizer under a genuine educational program.

The policy procedures for determining the kinds and quantities of materials to be manufactured should be outlined formally, and placed in the files of appropriate administrative officers, staff members, and divisions of TVA. That is to say, the procedures should be written down and used in annual decisions on manufacture and distribution of TVA materials. The statement of

policy procedures should clearly designate the officials within the Division of Agricultural Relations upon whom responsibility falls in determining the kinds and quantities of materials needed, and in conducting analyses relating to fertilizer pricing and distribution, for meeting the objectives of the educational program. It should include details relating these needs and analyses to implementation in materials manufacture and in distribution through an educational program. Lines of authority and responsibility in these respects should be definite by division, branch, and section.

2. **Better balance should be attained between the nature and size of the Distributor Demonstration Program and the size and qualifications of the TVA field staff.**

The field staff should be large enough, relative to the nature and size of the program and to the number of dealers, to allow a more complete implementation of objectives and procedures defined for the program. The ratio of field staff to distributing firms has been too small to permit the staff to give sufficient positive assistance and guidance to distributors and retailers in carrying out the program, or to permit adequate checking and enforcement of contractual obligations. In order that the field staff can operate effectively, it should be guided in its work by field procedures which are uniform and clearly defined.

3. **Closer contact should be maintained by the TVA central staff with field operations of the program.**

Annual or more frequent checks should be made by the TVA field force at the farm, dealer, and distributor levels similar (but on a smaller scale) to the current surveys by the Evaluation Committee. A large part of this information could be provided through more appropriate records and followup samples by retail dealers. However, records cannot substitute for frequent and continuous checks with wholesalers and retailers.

TVA should undertake a continuous evaluation of its Distributor Demonstration Program. While on a smaller scale and conducted by TVA personnel, the continuous evaluation might parallel that reported in this manuscript.

4. **Improved liaison should be established between TVA and the fertilizer industry, in order to intensify TVA activities for which there is mutual agreement and gain.**

Such activities would include training of personnel for industry, development of new materials, consideration of processes and cost data, test-demonstration activities, and other educational practices which augment farmers' incomes and extend the demand for, and the efficient use of, fertilizers. Investigation might also be made of such opportunities as: the least-cost distribution of fertilizer by TVA through exchange contracts with commercial firms at locations distant from TVA plants and offsetting sales to firms at locations near plants; defining an agreeable "constant" of fertilizer which TVA would provide in the market with geographic distribution so that it would not impinge great sacrifices on any one firm. This known constant could be discounted in the production plans of commercial firms and the fertilizer industry.

The trends in extremely large increases in fertilizer demand of the last few years, resulting especially from favorable price ratios and research and education on fertilizer yield response, will not continue in the near future. There are, however, potentials in profitable use and

▸Ammoniators* ▸Coolers ▸Dryers
▸Elevators
▸Granulators*
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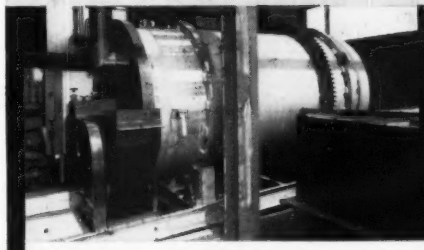

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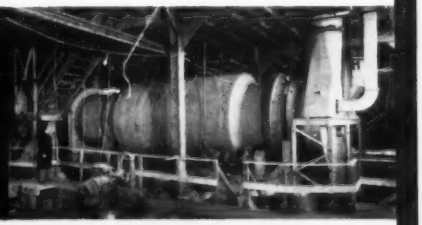

Built in a wide range of sizes, the DehydrO-Mat Dryer, though comparable in price, out-performs conventional dryers of similar volume. Compact, it is easy to install in a minimum of space. The varying diameter cylinder regulates air and material velocities . . . controls temperature drop and product retention time . . . assures gentle drying.

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demand for fertilizers which are not now being exploited. Examples include rented farms where leasing arrangements discourage use of fertilizer and low-capital farms where the operator can readily obtain credit for items such as livestock and machinery, but not for fertilizer. A large potential use also is on the forage and forest lands mentioned below. TVA might cooperate with the fertilizer industry in using its materials to overcome obstacles to using fertilizers on these farms and crops.

5. **An annual review of the Distributor Demonstration Program should be made in each state.**

In states where feasible, a state committee should be set up (e.g., as in Ohio and some other states at the present) to include Land Grant College personnel, TVA staff members, and representatives of other cooperating agencies. The Committee should aid TVA personnel in making the review and in suggesting new directions for the program.

6. **The TVA policy of initiating and conducting agricultural activities in cooperation with and through the Land Grant College system should be continued and expanded.**

Suggested areas for extending cooperation through the Land Grant Colleges might include work with Farm and Home Planning Programs of the Agricultural Extension Service, 4-H clubs, FFA organizations, Soil Conservation Service district and watershed programs, and credit institutions. TVA now cooperates, through its Distributor Demonstration Program, with several states both in Farm and Home Planning in 4-H club work. Cooperation should be greatly intensified with these groups and programs. One of the most effective areas of education on proper use of new and improved fertilizers is with young farm boys gaining their first experience in fertilizer use. In cooperation with the nationwide and rapidly growing Farm and Home Planning Program (also known as the Farm Development Program) emphasis would be on whole-farm planning and fertilization. A large potential program exists in this area, as might also be true for a program in cooperation with Soil Conservation Districts.

Investigation should be made of opportunities for cooperating with Land Grant Colleges in an educational and special-use program to extend fertilizer use on rented farms. Similarly, cooperative programs might be worked out with commercial banks, the Farmers Home Administration, and other credit institutions for developing credit arrangements to facilitate greater use of fertilizer on low-capital and low-income farms. The large increase in farm consumption of fertilizer over the past two decades resulted from factors which are not likely to be repeated in the next decade; namely, trends from a state of economic depression to a favorable farm economic situation, the rapid development of greater farm response knowledge, and innovations of improved kinds and types of fertilizer materials. The remaining large potential demand increase is on rented and low-capital farms and for pastures, haylands, and forest plantings.

TVA has issued a full statement on the committee's findings, conclusions and recommendations. Space limitations prevent our publishing it this month, but in general TVA's comments admitted justification of some of the criticism contained in the committee's conclusions and told what corrective measures are being and will be put into effect to remedy the situations.

INDUSTRY CALENDAR

Date	Organization	Place	City
Feb. 13-14	MidWest Soil Impr.	Edgewater Beach	Chicago, Ill.
Mar. 3-4	Sou. Fert. Safety	Peabody Hotel	Memphis, Tenn.
Oct. 22-24	Pacific N.W. Annual		Gearhart, Ore.
June 9-11	Sou. Control Officials	Heart'Atlanta Motel	Atlanta, Ga.
June 12	Fert. Safety Exec. Comm.	Hotel Roanoke	Roanoke, Va.
June 15-18	NPFI	The Greenbrier	White Sulphur
July 8-10	Pac. N.W. Fert. Conf.		Pocatello, Idaho
July 16-19	S.W. Fert. Conf.	Buccaneer Hotel	Galveston, Texas

N. C. County Meetings Promote Fertilizer Use

During the winter months of January and February most fertilizer dealers and salesmen will have had opportunities to hear the latest information from N. C. State College on the use of fertilizer and lime in North Carolina. The information will be presented at meetings held at the county level. These meetings have been organized by County Agents in cooperation with their local fertilizer people.

The purpose of the county meetings is to increase use of fertilizer in North Carolina on the basis of soil and crop needs. Nearly twice as much nitrogen, phosphate, and potash need to be used in the state on the basis of present soil fertility levels and cropping systems. The major obstacle in obtaining this goal is a general lack of information on the part of farmers concerning the profits they can make from fertilizer when they understand what fertilizers are and when they apply fertilizer on the basis of their soil and crop needs.

At the present there are 25 counties planning meetings for fertilizer dealers and farmers.

N. C. Soil Science Society Sets First Meeting

Dr. J. F. Lutz, Department of Soils at N. C. State College, has announced that May 22 and 23 are the dates for the first meeting of the Soil Science Society of North Carolina. These dates were set by the temporary officers in a recent meeting with Committee Chairman. The meeting will be in Williams Hall at State College in Raleigh.

The temporary officers for the Society are Dr. J. F. Lutz, Chairman; and Forrest Steele, Secretary. These officers were elected October 5, 1957 by a group that met to consider the formation of the Society. In this initial meeting there were persons from the fertilizer manufacturers, farm industry, fertilizer materials manufacturers, Soil Conservation Service, and Department of Soils at State College.

Efforts are being made to obtain a good membership in the Society from the fertilizer industries serving the state. Information presented at the annual meeting should prove very valuable to all persons interested in increasing efficient use of fertilizer and lime in North Carolina.

D. F. Wicks
New York, N.Y.

W. E. Noble
New York, N.Y.

H. L. Houser
Buffalo, N.Y.

T. C. Splane
New York, N.Y.

R. L. Walters
New York, N.Y.

S. G. Shetter
Middletown, Ohio

R. J. Stevens
Chicago, Ill.

J. J. Greene
Louisville, Ky.

R. G. Roberts
Chicago, Ill.

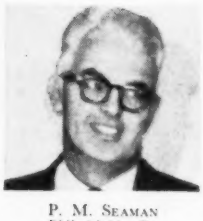
M. F. Keane
Cleveland, Ohio

W. R. Raleigh
Chicago, Ill.

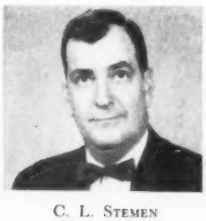
A. P. Wolff
Detroit, Mich.

R. T. Brown
St. Louis, Mo.

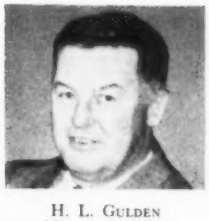
R. W. Drury
Kansas City, Mo.



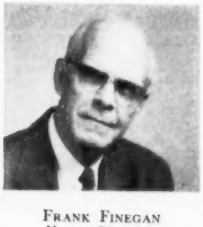
P. M. Seaman
Philadelphia, Pa.



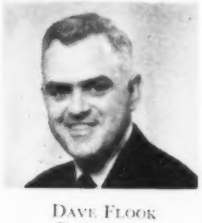
C. L. Stemen
Charlotte, N.C.



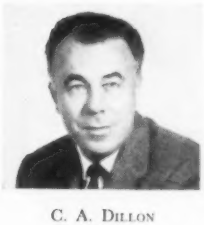
H. L. Gulden
Minneapolis, Minn.



Frank Finegan
Kansas City, Mo.



Dave Flook
Denver, Colo.



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Houston, Texas

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Sohio Hosts Liquid Fertilizer Producers To Launch Reference Booklet, New Solution

Some 125 liquid fertilizer manufacturers gathered January 16 for a symposium at Sohio Chemical Company's plant in Lima, Ohio, where the company introduced a new liquid fertilizer handbook that climaxed two years of research in its laboratories.

The booklet was the second to stem from this research activity, the initial publication having presented information and reference material for use in manufacture of solid mixed fertilizers. The second manual is pointed primarily to use of Sohio's nitrogen solutions in manufacture of liquid fertilizers. It is highlighted by graphs plotting salting-out and saturation temperatures for various grades against a graduated percentage of supplementary nitrogen supplied from urea, and has density and pH ranges specified for each of the various formulations used to produce each grade.

The company's technical representatives explained the data and described theories and research work on which the handbook was based.

On hand to help answer questions posed in the open-forum discussion that followed were Dr. K. G. Clark from U.S.D.A.'s Agricultural Research Service, A. V. Slack from Tennessee Valley Authority's Division of Chemical Development, and Dr. Vincent Sauchelli, National Plant Food Institute's chemical technologist.

E. F. Morrill, Sohio Chemical president, opened the meeting, and Don Stoll outlined the firm's petrochemical operations. Salesmanager H. J. Coleman gave the background on the company's production of nitrogen for fertilizer manufacturers.

C. M. Phinney, technical service representative for Sohio until recently, and now a Kansas liquid fertilizer manufacturer himself, described the problems posed by the liquid fertilizer industry and pointed out the specific need for some basic research to bring out the answers. "The industry has come so far so fast," he said, "that there has been a lot of difficulty in keeping up from a technological standpoint." "Salting-out was the number one headache, he stated, especially when

1. Ed Crouse of U.S. Liquid Fertilizer Co., Indianapolis, past president of National Fertilizer Solutions Assn.; Vincent Sauchelli, National Plant Food Institute chemical technologist, Washington; and A. V. Slack, chief of Program Development Staff, Division of Chemical Development, Tennessee Valley Authority, Wilson Dam, Ala.

2. Bert Tucker, Sohio's agricultural service director, and K. G. Clark, head of Fertilizer and Lime Section, U.S.D.A.'s Agricultural Research Service, Beltsville, Md.

3. Rodney Maxwell, Coop. G.L.F. Soil Building Service, Ithaca, N.Y.; George McGuffey, Sohio Chemical; Clarence, Ray and Lewis Gutwein of Gutwein Agricultural Service, Francesville, Ind.

4. Henry J. Coleman, Sohio salesmanager, and Tom Henry, Rainbow Chemicals, Tilbury, Ontario.

5. J. J. Eck, Lloyd Wolfe and Nathan Eck of Elko Fertilizer Co., Elkhorn, Wis.; and H. J. Schultz, Crop Service Co., Champaign, Ill.

6. Frank Nielsson, International Minerals & Chemical Corp., Chicago; Joe Reynolds of Baltimore and Lowell Yoder of Wakarusa, Ind., both with Davison Chemical Co. Div. of W. R. Grace & Co.

7. L. E. McDougle, Plant Life Food, Van Wert, Ohio; Delbert Shank and Harry Dills of Indianapolis and Dale Fawley of Warsaw, Ind., all three with U.S. Liquid Fertilizer Co.

8. Keith Thomas and Bill Rutan of Thorntown, Ind. and Dan Koches of Indianapolis, all with U. S. Liquid Fertilizer Co.

9. Marvin Renbarger, U.S. Liquid Fertilizer Co., Converse, Ind.; Bob and Gilbert Peine of Peine Grain Co., Minier, Ill.

formulating with lower-cost materials. In addition, there were wide discrepancies in the data on hand, and even in the nomenclature used. While a check on product pH helped to keep a tally on equipment and personnel, there was still discrepancies in the ammoniation rates used by various manufacturers.

Sylvester Grant, currently technical service representative for Sohio and formerly with their sales service and development lab, outlined the nature and scope of research efforts that produced data to be presented at the meeting.

H. H. Tucker, agricultural service director for the company, made the principal presentation. Illustrating results of the laboratory work with film-slide graphs, he pointed out effects of varying combinations of urea and ammonium nitrate in solubility of liquid mixed fertilizer products.

After a luncheon, visitors made a tour by bus of Sohio's petrochemical facilities, then returned to the recreation hall for the symposium session.

Sohio also announced at the meeting introduction of a new solution, Sohiogen 17, especially designed for use in fertilizer manufacture.

This miniature plant, authentically piped, is a ¼" model of the Sohio nitric acid and ammonium nitrate solutions plant. We learn that the model was of great assistance to the Chemical and Industrial Corp. construction team during the actual construction of the plant. It has been shown a number of times at the Chemical show, and always draws big crowds. Posed with it are some C&I men: Angus, Taylor, Jr.; Robert McConnell; Tom Long; Bernie Burke. The Sohio plant, at Lima, Ohio, was designed and constructed by C&I.

Their first fertilizer manufacturer's handbook covered in considerable detail the use of Sohiogen nitrogen solutions in solid fertilizer production. It deals with a variety of problems and processes of using nitrogen solutions, and treats such subjects as granulation vs. conventional mixing, formulation, calculations, cost analysis, handling of nitrogen solutions, and safety measures.

Both these handbooks are available for distribution to the industry, and copies may be obtained by writing to Sohio Chemical Co. at Lima, Ohio.

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One sure way of building fertilizer sales is to sell more to your present customers . . . and to obtain new customers. Today's prospects can be your customers of tomorrow . . . if you handle your selling campaign properly. How can you find prospects for your product? There are many successful plans in use. Here are only a few:

Know Your Territory

Your sales territory has specific plant food needs. For profitable yields, crops need plenty of fertilizer. So, it's important that you know the crops that grow in your area, their planting dates, customers' buying habits, soil types, and general agronomic factors. Your local county agriculture agent is a good man to know. Obtaining current agricultural information from him and from your state college, extension service, and other agricultural groups is the best road to knowledge of your markets. Use of educated recommendations as a practical guide for your prospects' and customers' fertilizer needs is a major selling tool.

Know Your Prospects

Mapping your territory farm by farm, calling on prospects, and determining who will be a buyer are the initial steps to increased sales. Farmers who own their own land are probably your best prospects. Tenants, too, can be good prospects because they may influence the purchase of fertilizers for the land they farm. Absentee landlords often share in the cost of farm production expenses and should be given every consideration. Learn the every consideration. Learn the names and addresses of all prospects. Develop a mailing list for the prospects to receive your fertilizer passout leaflets, announcements, and invitations to your farm meetings and field plot test demonstrations. Don't overlook 4-H and FFA group activities; these young people represent future prospects for fertilizer sales.

Sell Your Prospect

Organizing a selling campaign is the most important aspect of successful sales. You must check your territory to determine the areas that deserve your attention; then, make your calls so that you will get the maximum of calls with the least effort. To become better acquainted with your pospects, set up luncheon meetings at least once a week during the fall and winter months. Discuss fertilizer needs . . . and ASK FOR ORDERS. You can increase your contacts by attending field demonstrations sponsored by colleges and government groups; by assisting your college and agricultural agents in holding meetings and demonstrations; by encouraging attendance of your customers and prospective customers at all farm activities.

You may not have an opportunity to show your equipment, but you can drive an automobile or pickup identifying you with your business. Carefully identified distributors are most successful.

Call on Prospects

When you make calls, waste neither your or your customer's time. Cover all pertinent facts, give sound information, and refrain from making statements which might be misleading. A carefully planned sales presentation where each sales point is illustrated by visual aids are generally most successful. Bulletins, reprints, photographs, and kodachrome slides boost sales. Your job of presenting fertilizer to a prospect should be keynoted by benefits. Such facts are more profit per acre, lower production costs, extra feed or grazing for livestock, more uniform stand and growth of crops, and diversification of farming operations. You can make these points stand out by using sales aids: plant food guides, soil sampling, customer testimonials, test plots, demonstrations.

Your reasons for selling your prospect are obvious to you, but his reasons for buying are most important to him. A yield increase is to be expected. When you translate this expected yield increase in terms of dollars and cents, you are talking your prospect's language. Since one good customer sells another, keeping "old" customers sold becomes vitally important. You can keep him sold by repeating calls, keeping records of results, and reviewing customer's past results while writing **new** orders. You can use present good customers to obtain and sell prospects. Sell more to present customers and increase sales for your efforts.

From "Selling"—Phillips Chemical house organ.

KNOW FERTILIZERS AND WHAT THEY CAN DO. THESE FACTS INTEREST PROSPECTS

NITROGEN:

- **Imparts a dark green color to plants**
- **Produces rapid early growth for a bigger crop production**
- **Promotes increased leaf and stem growth**
- **Increases protein content of grain and forage**
- **Aids in the decomposition of organic matter**

PHOSPHATE:

- **Phosphate is essential to plant life. It stimulates early root formation and growth**
- **Hastens maturity**
- **Increases color of fruit, flowers and grains**
- **Helps seed formation and reproduction**
- **Produces winter hardiness of grains and hay crops**

POTASH:

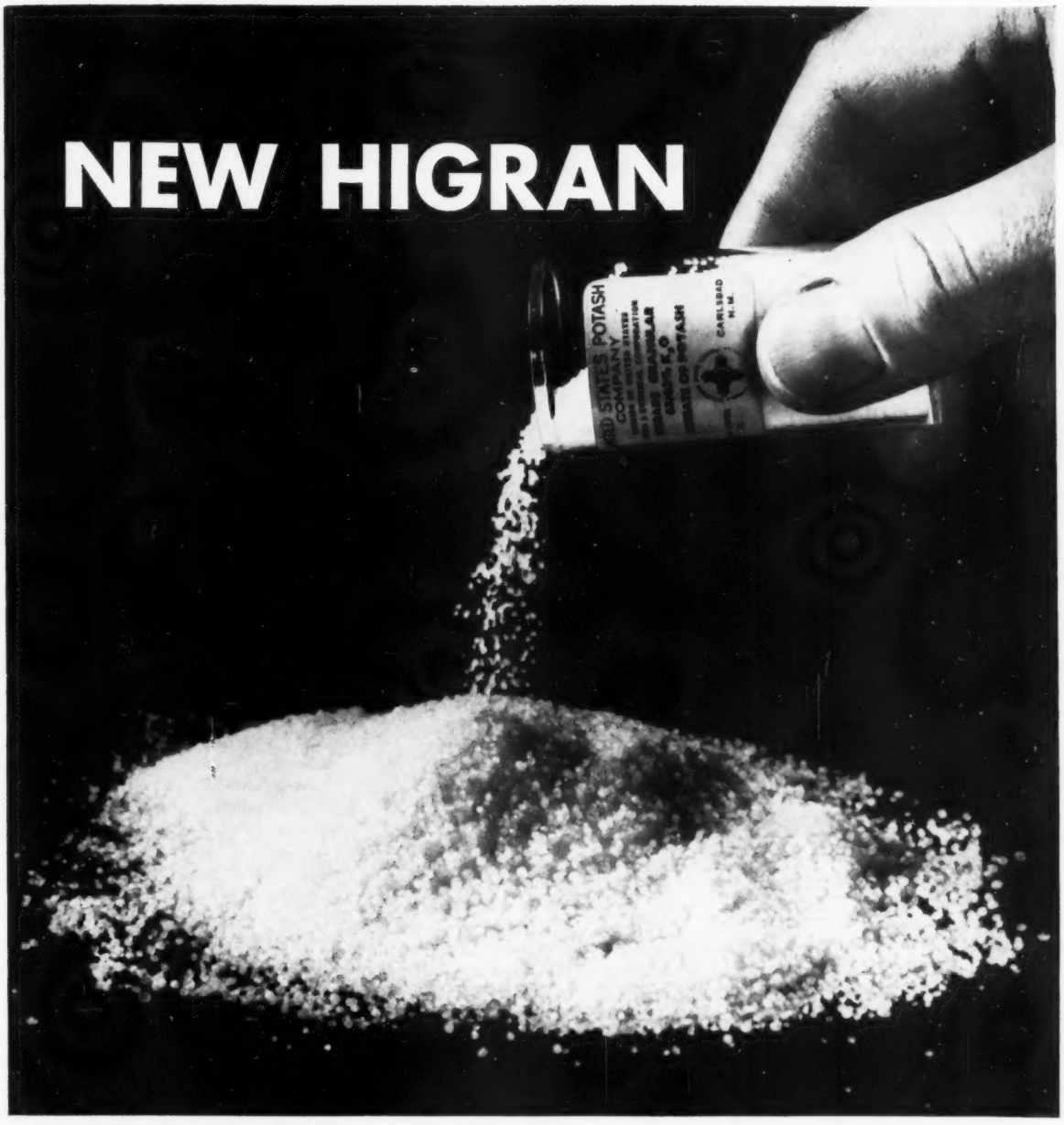
- **Increases plumpness of grains, seed and vegetable crops**
- **Injects increased vigor and disease resistance to plants**
- **Produces strong stiff stalks**
- **Is essential to the formation and transfer of starches, sugars and oils**
- **Improves keeping and shipping qualities of fruit and vegetable crops**

Feathers Old Stuff, Judge Rules

A patent on a way to make fertilizer out of feathers was ruled invalid recently by a U. S. District Court judge, on the grounds that there is nothing new about the idea. The patent was contested by 28 companies in 15 states.

Farm Machinery Up 15% Forecast

The Business and Defense Services Administration of the US Department of Commerce in its annual survey of major industries reports that sales of farm equipment and tractors should be up 10 to 15% over last year which in turn was above 1956. Improvement in farm income and more replacements are the basis for the encouraging forecast.



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USP announces the FIRST Higrade Granular muriate of potash designed specifically for the manufacture of today's modern fertilizers. Its perfect whiteness attests to its purity—the highest now available in granular agricultural muriate of potash. Non-caking and free-flowing throughout, USP's new Higrade Granular potash contains 62/63% K_2O! A regular supply of this important new potash product is immediately available from the U.S. Potash Co.

USP also offers Higrade muriate of potash—62/63% K_2O and Granular muriate of potash—60% K_2O—both free-flowing and non-caking.

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Device Permits Tape Closures

A new development announced by the **Dave Fischbein Company,** Minneapolis, makes possible for the first time, tape-bound closures with a completely portable bag-closing machine.

The new Fischbein Faseal tape-binding attachment for the Fischbein portable bag closer produces secure tape-bound closures on all types of multiwall paper bags. An attached knife severs tape and thread simultaneously after closure is made.

The portability of the closer is not affected by the tape-binding accessory; the bag closer with Faseal attachment can be used as a completely portable unit, or in suspension from a counter-balancing Fischbein suspension unit.

The Faseal Tape-binding Attachment can be quickly removed from the Fischbein Bag Closer when tape-bound closures are not required, or when the machine is used for closing textile bags.

A complete catalog file of Fischbein bag closing equipment may be obtained from the Dave Fischbein Company, 2720 30th Avenue South, Minneapolis 6, Minn.

Dow Announces Chelate Changes

A new chelating compound as well as new names for the entire chelate line have been announced by The Dow Chemical Company. The new product is Versenol Z, designed for curing zinc deficiency in avacodo orchards or deciduous trees of the northwest.

New names applied to chelate products will retain the Versenol and Versene trademarks but will be simplified. Under the new nomenclature, Versenol Iron Chelate will be known as Versenol F, Versenol Iron Chelate on Vermiculite will be Versenol FA, Versene Iron Chelate will be Versene F and Versene Iron Chelate on Vermiculite will be known as Versene FA. All of the names will appear on a redesigned line of packages planned to give uniform appearance to the line.

Chelating compounds are used in agriculture to overcome iron or zinc deficiencies in a wide range of garden and home plants, field crops, citrus or deciduous trees.

DuPont Grants For Science, Math

Grants of more than a million dollars have been awarded to 135 universities and colleges in DuPont's annual program of aid to education. Most of the $100,000 increase over last year's grants and more than half the entire program are grants to strengthen the education of scientists and engineers, supporting particularly the teaching of science and mathematics.

Klingman Writes Book On Southern Crops

Glenn C. Klingman is author of the newest book in the Southern Farm Series being published by John Wiley & Sons, 440 Fourth Ave., New York 16, N.Y. It is called "Crop Production in the South" and discusses the subject in the light of botany, plant physiology, genetics, chemistry and physics, all of which, Dr. Klingman holds, are part of the picture and must be integrated with any such discussion.

Separate chapters are devoted to forages, cotton, corn, tobacco, peanuts, soybeans and cowpeas, sorghums, sweet potatoes, Irish and white potato, wheat, oats, barley and rice. Dr. Klingman, professor of field crops at North Carolina State, was assisted editorially by Lyman J. Noordhoff, USDA information specialist.

The book contains 416 pages, and is priced at $4.95.

Gypsum Mountain A Problem To O.M.

Olin Mathieson have a pile of 3,000,000 tons of gypsum, which has impurities rendering it undesirable for wall board,—a veritable mountain known locally as "the highest point in East Texas." A by-product of fertilizer production, the gypsum occupies valuable land, and costs $100,000 a year to maintain. Perhaps some of our technical readers can think up an answer. We are sure Olin Mathieson will be duly grateful.

NPFI is continuing its fight on increased freight rates. Late last month, further statements and petitions were presented before the Interstate Commerce Commission, in oppositions to proposed fertilizer and fertilizer materials rates and charges.

Australia TEN YEARS HENCE

The Australian farm 10 years from now will be a place where skilled workers, operating a whole range of machines, will produce more with a smaller labour force, and will be applying the discoveries of agricultural science to vary their output.

This is the forecast made by Arthur F. Bell, in the latest issue of the Journal of the Australian Institute of Agricultural Science. As Under-Secretary for Agriculture in Queensland, he has taken a peep into the future to see the sort of agriculture Australia will have in the next decade.

He says farms will generally become larger and will produce a wider range of animal and plant crops, although one exception will be the sugar farms of Queensland. The mechanisation of farming will continue and the farm labour force will grow smaller, more skilled and more highly paid.

"A small skilled labour force, with suitable power units and appropriate implements for each job, can carry out all the operations on a large farm," he writes . . . "Moreover, each operation can be carried out expeditiously and so at the proper time.

"Skilled work is essentially permanent work, and so we see the passing of the farm labourer and his replacement with an artisan.

"There are now available implements to clear land, break it up and perform the operations of planting, cultivation, weed control, pest control and harvesting for nearly all field crops. There are mechanical levellers and ditchers for irrigation, scoops, loaders, unloaders and cranes, post-hole diggers and portable power-saws; silo fillers and unloaders. All these are operated by the power unit we have called a tractor.

"Much of this development has taken place since the war; it does not represent the culmination of mechanisation, but rather a preview of things to come."

Farm power will move away from the all-purpose tractor to separate tractors for primary and secondary tillage.

Mr. Bell says the capital investment in farms will continue to increase, and their management and organisation will become more complex. In short, he says, farming is becoming more a business and less a personal way of life.

Illustrating how the increasing farm mechanisation is altering conditions in primary production, Mr. Bell says every morning in the United States there are 7,000 new mouths around the national breakfast table. Yet every morning there are 1,000 fewer farm workers on the national payroll.

But these people are absorbed into other industries catering for the primary producer, such as the making of farm machinery, transport and the provision of services needed on the farm.

Mr. Bell believes that other changes coming in the next 10 years will include:

1—Tined implements will largely replace sod-turning ones. 2—Use of fertilisers for field crops will greatly increase. 3—Weed control will increasingly be carried out by spraying. 4—Crops will almost entirely be grown from certified, or pedigree seed. 5—Beef cattle will carry a growing proportion of "Indian" blood. 6—Herd recording will gradually become the basis for dairy herd management. 7—The increas-

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ing demand for milk will cause a breed shift towards cows producing more milk with a lower fat content. 8—Producers' marketing organisations will have to adopt more positive "selling" programmes and will be forced to enter the advertising field. 9—Price structures will include incentives for quality. 10 — Farm management advisory services will become established and freely accepted. 11—Technical and scientific training for farmers, and agricultural scientists will be recast and extended. 12—The community will realise that a country in Australia's position can't allow agricultural science to remain 'the cinderella of the professions."

Mr. Bell says the country is entering an era when primary production will call for ever greater and more intensified technical research, assistance and guidance. The need for highly trained agricultural scientists will become progressively greater.

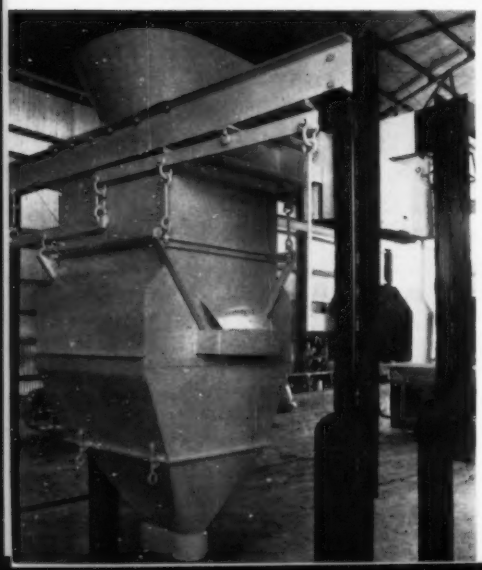
Yet the number of agricultural scientists becoming available is not sufficient to meet the needs. In Queensland during the past five years, as an example, only 21 graduates were available to fill vacancies in agricultural research and extension, and teaching services.

"We are in a competitive business, and we will be left behind if we do not keep pace with other countries," Mr. Bell warns.

Superior Tank Announces Davis Rotomatic Packer

The Davis Rotomatic Packer, new in design and principle, has been announced by Superior Tank Corporation, fabricators of the equipment. Power assets such as compressed air, electricity, etc. are completely eliminated on the Rotomatic, which differs from other packaging machines now on the market. The Rotomatic Packer operates on a simple mechanical principle for which the patent has been applied, the designer states, as the mechanism consists of few working parts and maintenance problems have been practically eliminated. Moving parts of the Rotomatic are completely ball bearing-supported and lubricated for life, the manufacturer claims, and dust from operation is sealed from the moving parts as is the atmosphere so that corrosion offers very little problem. The interior unit, subject to contact with the product, can be manufactured from plain carbon steel or stainless steel to suit the user's needs.

Davis Rotomatic Packaging Machine weighs 50, 80 and 100 pound lots, completely gravity operated, eliminating air or electricity.



The machine as shown in the accompanying picture is a completely finished unit, ready for use, and furnished complete with accessories for weighing 50, 80, and 100 pound lots. Even under the busiest conditions, production need not be slowed up because changing from one bag size to another takes only a few seconds, Superior's engineers say, as the entire operation is swift and simple and any unskilled hand can manage it with ease. At full capacity the unit can pack one 100-pound bag every two seconds, if other facilities of the plant can handle production at this speed. The speed of the machine can be easily and quickly adjusted to individual requirements.

Superior says the Rotomatic can be installed in one day, ready for use with extreme accuracy, as many problems are eliminated during installation since facilities for air and power are not required.

The bag filler is designed to place the air from the empty bag back into the machine where the vacuum created by the batch moving into the bag equalizes it, eliminating outside turbulence. The machine is claimed to lend itself to fertilizer plants since it does not create a dust problem.

The Davis Packer enters the packaging industry with a boast of simplicity, accuracy and speed. In addition to the Packer, a completely automated machine attachment that will place the empty bags on the unit is now being designed by Superior Tank Corporation, Tucker, Georgia, on U. S. Highway 29 near the outskirts of Atlanta,

Superior is an established fabricator of pressure vessels and other steel fabricated items, with a plant covering 25,000 square feet, is set up to manufacture the Davis Rotomatic Packer in quantities.

Crop Chemicals, '57, Equalled '56 Sales

National Agricultural Chemicals Assn. says the 1957 total of $250,000,000 just about equalled the 1956 figure. Of this some 20% went overseas, 20% to home and other nonfarm consumers, the remainder went to the farms of the US.

6th Annual Soil Builders Award

Farm magazine editors of the Nation are being invited to submit entries for the sixth annual National Plant Food Institute "Soil Builders Award for Editors" contest, the deadline for which is March 15.

The contest, sponsored by the Institute with the approval of the American Agricultural Editors' Association, is designed to honor editors and their staffs for their 1957 editorial contributions in the important field of building and maintaining soil fertility.

Judges for the contest, nationally-known in the field of agriculture, are: Marion Bunnell, President, National Association County Agricultural Agents, Yakima, Wash.; Roger Fleming, Secretary-Treasurer, American Farm Bureau Federation, Washington, D. C.; Nolen J. Fuqua, President, The National Association of Soil Conservation Districts, Duncan, Okla.; Wesley Hardenbergh, Vice Chairman of the Board, American Meat Institute, Chicago; Herschel D. Newsom, Master, The National Grange, Washington, D. C.; James Wall, President, National Vocational Agricultural Teachers' Association, Inc., Waverly, Nebr.

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C-I-L PLANT SETS SAFETY RECORD WITH 20 YEARS OF NO LOST-TIME

The six fertilizer plants of Canadian Industries Limited located in eastern Canada set a perfect safety record in 1957—the first in the last 10 years—L. V. Clegg, production manager of the company's agricultural chemicals division, announced here today.

The plants are located at Halifax; Montreal; Beloeil, Que.; Hamilton, Ont.; Chatham, Ont.; and Norwich, Ont.

According to Mr. Clegg, the plants have amassed a total of almost 4,000,000 accident-free manhours. Some of the plants have remarkable records. The Halifax plant hasn't had a lost-time accident for the past 14 years while the Chatham plant has been accident-free for more than 10 years. Regular employee strength in all plants is about 225.

A small group of Hamilton men Jan. 14 rounded out a record-breaking 20 years without a lost-time accident in their work. They are employees of the superphosphate department of C-I-L's agricultural chemicals plant. At midnight the eleven men, whose work involves treatment of phosphate rock with sulphuric acid and use of high pressure, had gone over 500,000 manhours without mishap. To mark the safety milestone, the company feted the 11 men at dinner on January 18.

Under a plan backed by C-I-L, the men themselves are responsible for their own safety on the job. They elect their own safety committees, hold monthly safety meetings, and make regular inspections of all corners of the plant, keeping an eagle eye open for hazards and eliminating them before they can cause an accident.

"When it comes to safety, the men in the superphosphate unit work as a team," Bill Plummer, production superintendent, says. "They work on the principle that safety is every man's business. They regard safety as important a product of their daily efforts as the superphosphate they produce.

"The superphosphate unit is in operation 24 hours a day and the record of 20 years without a lost-time accident is a tribute to the high spirit of safety and teamwork they've achieved and passed on from shift to shift."

Reports Increase In Ammonia Use

The British Sulphate of Ammonia Federation, Ltd., reports that world production and consumption of ammonia in the fertilizer year ended June 30, 1957, were approximately in balance.

The federation estimates world production at 9,231,000 metric tons, an increase of 7 percent over the preceding 12 months, and consumption at 9,272,000 metric tons, a gain of 11.1 percent over the year before. Production of sulfate of ammonia for the 1957 year is estimated at 2,276,000 metric tons, increase of 3.3 percent over year before. Output of other forms of ammonia are estimated by the federation to have been 8.7 percent above preceding 12 months.

Crop Chemical In London

An unusual specialised exhibition is to take place in London next May. This is the Crop Protection and Pest Control Exhibition, to be organised by "World Crops," the international journal of agriculture.

The dates of the exhibition are May 12 to 15, and it will be held at the Royal Horticultural Society's New Hall. Many thousands of invitation leaflets are being despatched to agriculturists and others in overseas countries, and it is hoped that the event will provide a stimulus to international trade in agricultural chemicals and equipment. Many leading companies have already booked stands at the exhibition.

Further information from: John Wheatley, Organiser, The Crop Protection and Pest Control Exhibition, Leonard Hill House, Eden Street, London, N.W.1. EUSton 5911.

Quotes - - -

"Many of you recall that early attempts at accident prevention in industry consisted primarily of guarding machines. This method in accident control did not solve the problem. Our official records show that the majority of industrial accidents result from the unsafe acts of employees. This being true then most of our efforts should be made in the field of human relations." N. C. Safety Bulletin.

W. R. Thompson, Mississippi extension pasture specialist advised farmers "In 1958 fertilizer and management will be your greatest grass growing tools. But if you try to use one without the other, you will be disappointed as the two go hand in hand."

Planning is another important factor in a successful pasture program. "Sit down and study all of the pasture recommendations that fit your area. Half a day spent studying will probably make you a lot of money and also save you some money by keeping you from making some mistakes," he said. "Plan your grazing for each season of the year and you are apt to have some pretty good results."

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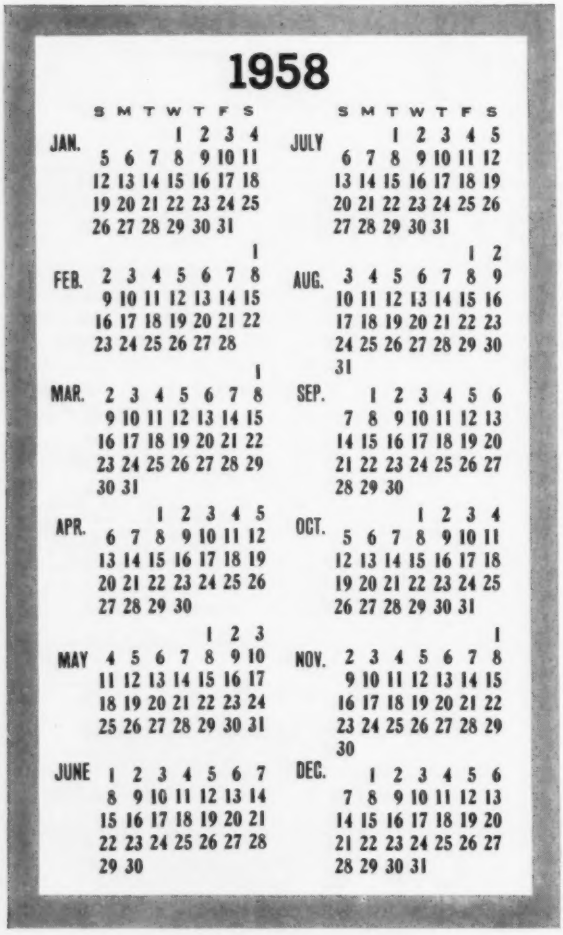

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